AD- 394356

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HIGH ALTITUDE PERFORMANCE TEST OF THE YJ97-GE-3 TURBOJET ENGINE (S/N E447052) (PART II) (U)

W. R. Warwick, R. E. Harper, and T. P. Miller

ARO, Inc.

December 1968

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FOREWORD

(U) The work reported herein was performed at the request of the Air Force Aero-Propulsion Laboratory (AFAPL) (APTP), Air Force Systems Command (AFSC), under System 468A, for the General Electric Company under Contract AF33(657)-16142.

(U) The results of this test were obtained by ARO, Inc. (a subsidiary of Sverdrup & Parcel and Associates, Inc.), contract operator of the Arnold Engineering Development Center (AEDC), AFSC, Arnold Air Force Station, Tennessee, under Contract F40600-69-C-0001. The tests were conducted in Propulsion Engine Test Cell (T-4) of the Rocket Test Facility (RTF) from May 16 to 29, 1968, under ARO Project No. RD0820, and the manuscript was submitted for publication on October 4, 1968.

(U) This report contains classified information extracted from the Model Specification No. E-2054 for YJ97-1 and YJ97-3 engines, dated August 1, 1966, and its revisions dated February 1967 and January 1968, Confidential, Group 1, and from AEDC-TR-68-167, dated October 1968, Confidential, Group 1.

(U) This technical report has been reviewed and is approved.

Donald W. Ellison
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CONFIDENTIAL ABSTRACT

(C) A turbine endurance test was conducted on a YJ97-GE-3 engine as a penalty run after a turbine failure during an official Qualification Test. The turbine completed the endurance test without failure. The performance of the endurance test engine is compared with the performance of the initial Qualification Test engine that encountered the turbine failure. In addition, the effects on engine performance of shaft power extraction, tailpipe thermal insulation, and exhaust gas swirl are presented along with the exhaust nozzle isentropic gross thrust coefficient.

CONTENTS

APPENDIXES

I. ILLUSTRATIONS

NOMENCLATURE*

A	Area, in.^{2} or ft^2
AE8	Primary exhaust nozzle effective throat area, in.^{2}
ALT	Altitude, ft
CF	Discharge coefficient
CFG	Convergent-divergent equivalent thrust coefficient
CV	Velocity coefficient
c_p	Specific heat at constant pressure, Btu/lb$_m$-°R
c_v	Specific heat at constant volume, Btu/lb$_m$-°R
DTO	Off-standard temperature, ±°F
ETABM	Main burner efficiency, percent
ETAC	Compressor efficiency, percent
F	Fuel-air ratio, lb$_m$-fuel/lb$_m$-air
FD	Ram drag, lb$_f$

*The symbols in this nomenclature were made to agree with the nomenclature in the Engine Specification (E-2054, Ref. 6) as far as possible. Where there was no guide in Ref. 6, terms were used that are consistent with current program usage.

FNMB	Calculated net thrust, momentum balance, lb_f
FNS	Measured net thrust, scale force, lb_f
g_c	Dimensional constant, 32.174 lb_m-ft/lb_f-sec^2
H	Enthalpy, Btu/lb_m
HPE	Horsepower extracted, hp
h_L	Lower heating value of fuel, Btu/lb_m
J	Mechanical equivalent of heat, 778.3 ft-lb_f/Btu
L	Length, ft
M	Mach number
N	Mechanical rotor speed, rpm
P	Total pressure, psia
PCN	Percent rotor speed
PCN/RT	Percent corrected rotor speed
PR	Relative pressure ratio
PS	Static pressure, psia
Q	Heat rate, Btu/hr
R	Gas constant for air, 53.34 ft-lb_f/lb_m-°R
RAM	Ram recovery factor
RF	Thermocouple recovery factor
RN	Reynolds number
RNI	Reynolds number index
SFC	Specific fuel consumption, $\frac{lb_m\text{-fuel/hr}}{lb_f\text{-net thrust}}$
T	Total temperature, °F or °R
TS	Static temperature, °F or °R
V	Velocity, ft/sec
W	Weight flow, lb_m/sec or lb_m/hr
WF	Fuel flow, lb_m/hr
β	Swirl angle, deg
γ	Ratio of specific heats, c_p/c_v

δ	Relative pressure, (P2/14.696)
ϵ	Emissivity ratio
θ	Relative temperature, (T2/518.67)
μ	Viscosity, lb_m/ft-sec
ρ	Density, lb_m/ft^3

SUFFIXES

ADJ	Adjusted to desired test conditions
C	Cooling
D	Adjusted to calculated altitude and Mach number conditions
H	Corrected for thermal growth
I	Isentropic
O	Ambient conditions at desired test altitude
SP	At specification condition
X	Calculated
*	Corrected to sea-level static conditions

SUBSCRIPTS

eng	Engine
i	Indicated
o, cell	Test cell conditions
X	Calculated

STATIONS

00	Airflow measuring venturi inlet
1N	Airflow measuring venturi throat
1D	Venturi discharge
LS	Labyrinth seal cavity
1	Primary air supply duct

2	Compressor inlet
2P	Test cell plenum
3	Compressor discharge
31	Burner inlet
39	Burner discharge
4	Turbine inlet after WC3 is added to the stream
5	Turbine discharge before WC4 is added to the stream
51	Turbine discharge after WC4 is added to the stream
52	Tailpipe inlet
7	Tailpipe exit
8	Primary nozzle throat
9	Secondary nozzle exit

SECTION I
INTRODUCTION

(C) The J97-GE-3 power plant is a single-spool, nonafterburning, turbojet engine designed for optimum performance at very high altitudes. Five altitude development tests of this engine have been conducted previously at AEDC (Refs. 1 through 5). The manufacturer's identification for this engine was GE1 before it was designated J97.

(C) The purpose of the test program was to conduct the engine performance portion of an official engine Qualification Test, with J97-GE-3 engine S/N 447007, at all of the guarantee flight conditions listed in Table II of the Engine Specification (Ref. 6). Because of a second-stage turbine disk failure on this engine during testing at N + 5000 ft, the low altitude portion of the test program was not completed.

(C) The turbine failure on engine S/N E447007 made it necessary to conduct a penalty endurance test on a second engine to verify the endurance guarantees for the turbine rotor. The endurance test was successfully conducted on J97-GE-3 engine S/N E447052. This report presents the results of the turbine endurance test, conducted on J97-GE-3 engine S/N E447052, and a comparison of the performance of engines S/N E447007 and E447052. In addition, the effects of shaft power extraction and tailpipe thermal insulation on the performance of engine S/N E447007 and of exhaust gas swirl are presented. Some information on exhaust nozzle total pressure and nozzle thrust coefficient is included.

(C) The results of the official performance data from the test of J97-GE-3 engine S/N 447007 were incorporated in a separate report (Part I, Ref. 7). The analysis of the turbine failure on J97-GE-3 engine S/N E447007 is presented in Ref. 8. Data from both engine S/N E447007 and engine S/N E447052 are utilized in Section IV of this report (Part II); however, all of the other sections apply only to engine S/N E447052 unless otherwise stated. The Apparatus, Procedure, and Methods of Calculations for engine S/N E447007 are included in Ref. 7.

SECTION II
APPARATUS

2.1 TEST ARTICLE

(C) The YJ97-GE-3 engine (Fig. 1, Appendix I) used for this investigation is an axial-flow, nonafterburning, single-rotor turbojet

incorporating variable compressor stators, a two-stage turbine, a tailpipe with a 7-deg canted aft section, and a fixed-area converging nozzle. The engine normally utilizes a secondary air ejector nozzle designed to increase engine thrust. However, the secondary nozzle was not installed for the endurance test. The engine has a thrust-to-weight ratio of 6:1 at a maximum thrust rating of 4400 lb_f at sea-level static conditions. The dry weight of the engine (including tailpipe and secondary nozzle) is 739 lb, overall cold length is 109.5 in., and inlet diameter is 20.1 in.

(C) The compressor is a 14-stage unit with a pressure ratio of 13.5:1 and an airflow of 70.4 lb/sec at 13,650 rpm at sea-level static operation. The inlet guide vanes and first five stator stages are integrally variable and scheduled as a function of compressor rotor speed and compressor inlet temperature. The forward frame assembly includes the inlet guide vanes, forward bearing and support struts, and a drive for the engine gearbox. The compressor rear frame assembly includes the compressor outlet guide vanes, outer combustor casing, turbine frame, and the number 2 and 3 oil sumps.

(C) A two-stage, air-cooled turbine drives the compressor. Cooling air is bled from the compressor discharge and admitted to the turbine section through ducts and orifices in the turbine first-stage stator and rotor blades.

(C) An annular combustor is attached at the forward end of the compressor rear frame by bolts through the rear frame. Eighteen fuel nozzles are flange mounted to the compressor rear frame and extend into the combustor inlet centered in the combustor inlet swirl cups. The fuel nozzles contain high- and low-flow spin chambers with an integral scheduling valve which proportions the flow to each spin chamber.

(C) The ignition system consists of a power source, leads, and two igniter plugs. The system is a noncontinuous capacitor discharge type with a rating of 4 (min) to 10 (max) joules. The minimum spark rate is 2 sparks/sec/plug at an input voltage of 115 volts at 400 Hz.

(C) The primary exhaust section for the engine S/N E447052 test (Fig. 2) was comprised of a canted tailpipe and a 139-$in.^2$ fixed-area conical exhaust nozzle. The tailpipe and centerbody at the turbine discharge form an annular diffuser which terminates 17.2 in. from the diffuser inlet in a full cylindrical cross section. Eleven, long-chord, antiswirl, airfoil-shaped struts are located in the diffuser. The cylindrical section is canted 7 deg beginning at a point 35 in. from the tailpipe inlet.

(U) The main fuel pump is mounted on and driven by the engine gearbox and in turn drives the main fuel control (MFC) which is tandem mounted on the pump. The main fuel pump is a two-element unit containing a centrifugal boost element and a single-stage, vane-type, high-pressure element.

(U) The fuel control is an isochronous-type hydromechanical unit which limits acceleration, steady-state, and deceleration fuel flows; limits speed as a function of compressor inlet temperature; limits compressor discharge static pressure and maximum exhaust gas temperature; and controls stator vane position by regulated fuel servopressure to the fuel-operated, stator vane hydraulic actuators.

(U) The main lube pump is a positive displacement type with engine, customer, and scavenge units. The lube system incorporates an auxiliary water-oil cooler in series with the engine-mounted fuel-oil cooler to maintain the lube oil temperature below the 300°F specification operating limit.

(U) A thermal insulating blanket (shredded asbestos sandwiched between two stainless steel sheets) was installed on this engine (S/N E447052) and engine S/N E447007. The blanket extended from the rear frame aft flange on both engines to the upstream end of the secondary air plenum chamber on engine S/N E447007 and to the exhaust nozzle mounting flange on engine S/N E447052. The turbine rotor assembly configuration for this engine (S/N E447052) was identical to the turbine rotor assembly for engine S/N E447007.

(U) The horsepower extraction unit and number 3 oil sump insulation blanket, used during previous testing of engine S/N E447007 (Ref. 7), were not installed. A flight-type generator was mounted on the transfer gearbox but was not loaded to extract power.

2.2 INSTALLATION

(U) The engine assembly was mounted on a thrust stand, which in turn was flexure mounted on a model support cart and installed in Propulsion Engine Test Cell (T-4) (Fig. 3). A detailed description of the T-4 test cell is presented in Ref. 9. The engine inlet duct extended into a zero-leakage, labyrinth-type air seal mounted on the downstream bulkhead of the engine inlet plenum. The engine inlet plenum contained two flow-straightening grids with screen overlays and a bellmouth to ensure a smooth flow of air into the engine inlet. The primary airflow rate was measured using two critical-flow venturis located 27.5 ft upstream of the engine inlet plenum.

(U) The lube oil tank is not engine equipment and is not engine mounted; therefore, a General Electric-supplied substitute tank was mounted on the thrust stand. The discharge from the customer port of the main lube oil pump was returned directly to the oil tank.

2.3 INSTRUMENTATION

(U) Aerodynamic pressure and temperature measurements were made at the stations shown in Fig. 4. Diagrams showing the number and type of instrumentation at each station are shown in Fig. 5.

(U) Pressure and scale force were measured with strain-gage-type transducers, and temperatures were measured with iron-constantan (IC), copper constantan (CC), and Chromel®-Alumel® (CA) thermocouples. The millivolt outputs of the transducers were recorded on magnetic tape from high-speed, analog-to-digital converters and converted to engineering units and calculated performance parameters by a digital computer. Selected channels of pressure, temperature, and vibration (designated as safety parameters) were displayed in the control room and were photographically or manually recorded. A flight-type thermocouple harness for measuring turbine discharge temperature (station 55, Fig. 5) was provided with the engine, and the output was registered on a null-balance potentiometer and recorded both manually and automatically.

(U) Exhaust gas swirl angle measurements were made with a wedge-shaped traversing probe which utilized a pressure sensing null-balance system to determine swirl angle and a strain-gage-type pressure transducer to measure stream total pressure. The probe actuator contained two electric motors which provided for probe rotation and radial translation through the exhaust gas stream. Total pressure, swirl angle, and radial position were continuously recorded by a null-balance potentiometer system.

(U) Fuel, lube oil, and hydraulic fluid flow rates were measured by turbine-type flowmeters. The output signal was recorded on magnetic tape from frequency-to-analog converters and converted to flow in pounds per hour by a digital computer. Control room indication was displayed on digital electronic frequency converters from a frequency-to-shaped waveform converter. Water flow was measured with a dynamic weigh-time system utilizing a beam-balance weight-measuring device.

(U) The instrumentation ranges, recording methods, and posttest estimates of measurement uncertainty are presented in Table I (Appendix II).

2.4 CALIBRATION

(U) All pressure measuring transducers were laboratory calibrated with an NBS secondary standard pressure generator prior to usage in this program. The thrust measuring system was calibrated in place by applying known force levels to the thrust stand. The calibration forces applied to the thrust stand were generated by a hydraulic loading system. Calibration force levels were determined from load cells installed in the loading system that had been calibrated against a secondary standard. The fuel flowmeters were calibrated in place with a mass weighing system. The fuel flowmeter calibrations were performed at temperatures and pressures comparable with run conditions.

(U) After installation of the sensors in the test cell, the data acquisition systems were electrically calibrated. The thrust systems were electrically calibrated using known resistances in the circuits to simulate known pressure and force levels. The pressure systems were pressure calibrated in place with a fused-quartz, Bourdon-tube-sensor, precision pressure gage, incorporating optical measurement of deflection and digital presentation. The thermocouple output recording systems were spanned to cover the thermocouple output voltage range, and the NBS temperature-millivolt calibration for each type of thermocouple was used for data reduction. The flowmeter data acquisition system was calibrated using selected inputs from an NBS secondary standard frequency generator to simulate flowmeter outputs. Calibration of the data acquisition systems was conducted at sea-level ambient conditions prior to each run.

SECTION III
PROCEDURE

3.1 SIMULATED FLIGHT CONDITIONS

(U) Conditioned air was supplied to the compressor inlet at the total pressure and temperature required to simulate the desired flight condition. Test cell pressure was set at the level corresponding to the desired altitude based on the geopotential measure (H) of the U. S. Standard Atmosphere (Ref. 10). One-dimensional, isentropic,

compressible flow functions were used to determine the compressor inlet pressure and temperature for a desired Mach number. An engine inlet pressure ram recovery factor of 0.99 was used for all flight conditions.

(C) For the endurance run, the compressor inlet total temperature was increased 9°F (from -4 to +5°F) at the full-open power lever position (resulting PCN/RT = 106.1) at N + 5000 ft, Mach number 0.85, to obtain the maximum rated turbine inlet temperature of 2710 ± 20°R. This increase in T2 was necessary to obtain the rated turbine inlet temperature at these flight conditions because the power extraction unit was not installed on engine S/N E447052 as it was on engine S/N E447007. The engine was operated in this manner at these conditions for 4 hr to complete the endurance test requirements.

(C) Engine steady-state performance was determined over a range of Mach numbers from 0.60 to 0.85 and altitudes from N - 35,000 to N + 5000 ft.

3.2 FUEL AND OIL

(U) Fuel conforming to MIL-T-5624G, Grade JP-4, and oil conforming to MIL-L-7808F were used during this investigation.

3.3 DATA AND CALCULATIONS

(U) The methods used in calculating the steady-state parameters are presented in Appendix III. The tabulated steady-state test data are presented in Appendix IV.

SECTION IV
RESULTS AND DISCUSSION

(C) As a result of the turbine section failure (Refs. 7 and 8) experienced on J97 engine S/N E447007, it became necessary to utilize another engine to complete the performance portion of the J97 Qualification Test. The failure of the turbine in engine S/N E447007 was attributed to a deterioration of the number 3 oil sump insulation blanket which permitted particles from the blanket to restrict the turbine cooling air flow passages (Ref. 8).

(U) This report presents the results of the turbine endurance test conducted on YJ97-GE-3 engine S/N E447052 and a comparison of the performance with engine S/N E447007. In addition, the effects of shaft power extraction, tailpipe thermal insulation, and exhaust gas swirl on the performance of engine S/N E447007 are presented. Some information on exhaust nozzle total pressure measurement and exhaust nozzle thrust coefficient is included.

4.1 TURBINE ASSEMBLY ENDURANCE TEST (ENGINE S/N E447052)

(C) The specified flight conditions for the endurance test were N + 5000-ft altitude at Mach number 0.85. Deviations in compressor inlet total temperature from standard day values for the above flight conditions were made to obtain the rated turbine inlet temperature without a shaft power extraction system. The specified operating range for turbine inlet total temperature (T4) was 2710 ± 20°R. During testing on engine S/N E447007 (Ref. 7) with the power lever at the full-open position and with approximately 15 hp extracted, calculated T4 was approximately 2710°R at N + 5000-ft altitude and Mach number 0.85. Without power extraction on engine S/N E447052, the maximum level of T4 at the same flight conditions was approximately 2660°R. Therefore, to obtain the required turbine inlet gas temperature, compressor inlet total temperature was increased 9°F (from -4 to +5°F) with the power lever in the full-open position. The endurance test was then conducted at the desired compressor inlet total pressure (P2) and cell pressure (P_o) while compressor inlet temperature (T2) was held at the level required to give the required T4. The engine was operated at 106.1-percent corrected engine rotor speed throughout the endurance cycle.

(C) Calculated turbine inlet total temperature (T4) during the endurance cycle is shown in Fig. 6. The temperature was within the specified operating range for 4 hr of continuous operation. The arithmetic average of the T4 levels for all data points, which were taken at approximately 10-min intervals, is 2710°R.

4.2 OPERATIONAL EXPERIENCE (ENGINE S/N E447052)

(C) A summary of engine S/N E447052 operating time during the test reported herein is contained in Table II. Total engine operating time was 19 hr and 18 min, including 4 hr of operation at the rated turbine inlet temperature of 2710 ± 20°R at N + 5000-ft altitude, Mach number 0.85. The maximum observed vibration levels on the compressor front and rear frames were 0.9 and 2.1 mils, respectively (Table II), which were well below the respective 4- and 6-mil limits.

(C) A total of nine altitude windmill start attempts was made with engine S/N 447052 between 30, 000- and 39, 000-ft altitude. A summary of the starting conditions is presented in Table III. All start attempts were successful. It should be noted that a systematic altitude start investigation was not conducted.

(C) A summary of engine flameout experience with engine S/N E447052 at AEDC is presented in Table IV. Four flameouts or stalls were encountered. The first flameout occurred at relatively low engine speed (93 PCN/RT) during a transition from N - 45, 000 ft to N altitude. The second flameout occurred at N altitude during compressor inlet pressure fluctuations caused by unstable facility conditions. The rate of change in inlet pressure was approximately 0.6 to 0.9 psia in less than 1 min. There was no warning or unusual engine operation preceding the flameout.

(C) Two conditions which appeared to be compressor stalls were encountered at N + 5000-ft altitude wherein fuel and compressor discharge pressure oscillations, accompanied by an increasing T55, were observed. The throttle was chopped on both occurrences. However, the engine was operated at other times during the program at the same flight conditions and engine speeds with no problems. The labyrinth seal pressure balance system was known to be unbalanced at the 106 PCN/RT (N + 5000-ft altitude) condition (Table IV), and it is possible that this unbalance generated an inlet distortion level that contributed to the stall. It is further possible that the same condition existed at the 103 PCN/RT (N + 5000-ft) stall point. No flameouts were encountered with engine S/N E447007 (Ref. 7). A systematic flameout or stall investigation was not attempted with either engine S/N E447007 or engine S/N E447052.

(C) The engine was shut down after a normal cooldown period after completion of the endurance test. Posttest inspection of the turbine revealed slight discoloration of the blades and evidence of slight blade tip rub on the second-stage rotor. No intermediate visual inspection was made on the turbine between installation and posttest inspection; therefore, it is not known if the blade tip rub occurred during earlier testing (prior to the endurance test period) or during the endurance cycle. The turbine assembly was returned to the manufacturer for additional posttest inspections.

(C) The measured maximum heat rejection on engine S/N E447052 required to keep oil pump inlet temperature below 300°F was 108 Btu/min; this maximum heat rejection was extracted through the auxiliary oil-water cooler and was obtained during the 4-hr endurance

cycle at N + 5000-ft altitude and a flight Mach number of 0.85. The engine was operated with 80°F fuel at the fuel pump inlet. The engine specification heat rejection criteria are based on a fuel inlet temperature of 100°F. If fuel inlet temperature had been increased from 80 to 100°F, increased heat rejection into the auxiliary cooler would be less than 100 Btu/min in order to maintain the oil temperature below 300°F. The specification states that the maximum heat rejection required at the most severe conditions (N + 5000-ft altitude) will be 645 Btu/min; therefore, the engine heat rejection requirement at this condition is approximately 445 Btu/min below the specification limit.

(U) On engine S/N E447007 (with a number 3 oil sump insulation blanket installed), the maximum observed oil pump inlet temperature was 293°F with no water flow into the oil-water cooler. The increase in heat rejection rate to the cooling water, as a result of removing the number 3 bearing sump insulating blanket from engine S/N E447052, was, therefore, 108 Btu/min.

4.3 COMPARISON OF J97-GE-3 ENGINES S/N E447007 AND E447052

(U) Engine S/N E447007 was tested with a secondary nozzle system installed, and engine S/N E447052 was tested with a primary nozzle only; therefore, a direct comparison of measured thrust and SFC can not be made . The airflow, fuel flow, engine pumping characteristics, isentropic thrust, and SFC of the two engines are compared in Figs. 7 through 10 with the tailpipe thermal insulating blanket installed and with no shaft power extraction.

(C) Engine S/N E447052 had 0.7 percent higher airflow (W2) and 0.9 percent lower fuel flow (WF) at 106.6 PCN/RT at N altitude, Mach number 0.80 (Figs. 7 and 8). The pumping characteristics of the two engines are presented for test conditions of Mach number 0.80 at N altitude in Fig. 9. The gas generator pressure ratio (P52/P2) for engine S/N E447052 was approximately 1.3 percent higher than for engine S/N E447007 at a constant temperature ratio (T51/T2).

(C) To increase confidence in the comparison of the pumping characteristics and other parameters utilizing T51 (a calculated parameter based on an assumed burner efficiency), the following verification of the consistency of T51 is presented. At a constant corrected rotor speed of 106.6 percent at N altitude, Mach number 0.80, P52 and W2 were 0.25 and 0.7 percent greater, respectively, for engine S/N E447052 than for engine S/N E447007. Since the exhaust nozzle throat area (A8) was the same and the exhaust nozzle was choked for both engines, the

parameter ($W_{g8}\sqrt{T51}/P52$) must be equal for both engines if the tail-pipe pressure and temperature losses and nozzle flow coefficients are assumed equai. Therefore, the 0.25- and 0.7-percent increase in P52 and W2, respectively, on engine S/N E447052 should be accompanied by a 0.9-percent decrease in T51 (0.45 decrease in $\sqrt{T51}$). This is verified in Fig. 9; T51 for engine S/N E447052 was 1.1 percent less than T51 for engine S/N E447007 at the same conditions.

(C) The isentropic net thrust and SFC for both engines are compared in Fig. 10 at N altitude, Mach number 0.80. The isentropic values were used because of the differences in the exhaust nozzle configurations. Note that the units of SFC were changed from the standard $lb_m/hr\text{-}lb_f$ to $lb_m/sec\text{-}lb_f$ so that the values of isentropic SFC would not be inadvertently confused with the actual SFC of the engine. Engine S/N E447052 had a lower SFC (1.5 percent) than engine S/N E447007 at 106.6 PCN/RT, as would be expected from the higher cycle efficiency (Fig. 9) and the lower fuel flow (Fig. 8). The isentropic net thrust of both engines was equal at these conditions at 106.6 PCN/RT.

4.4 SFC THRUST RELATIONSHIP AT N + 5000-FT ALTITUDE

(C) Data were obtained at N + 5000-ft altitude at Mach number 0.85 during the previous tests of engines S/N E447051 and E447007 (Refs. 5 and 7). However, during both of these previous tests, only a very narrow range of engine rotor speeds was obtained at N + 5000 ft. During the test of engine S/N E447052, special efforts were made to operate over a larger range of rotor speeds in order to obtain some information on the range of engine operating limits at these conditions and to define more completely the shape of the thrust versus SFC curve at N + 5000-ft altitude.

(C) Engine S/N E447052 was operated at corrected rotor speeds (PCN/RT) from a maximum of 106.7 percent down to a minimum of 101.8 percent. The adjusted net thrust and SFC are presented for these data at N + 5000 ft, Mach number 0.85, in Fig. 11. These thrust and SFC data are presented here only to define the approximate shape and slope of the curve at these test conditions. The absolute levels of thrust and SFC are not comparable with engine S/N E447007 or with the engine model specifications because the engine was not equipped with a secondary nozzle or a hydraulic pump for shaft power extraction.

4.5 TAILPIPE INSULATION BLANKET

(C) During the tests of YJ97-GE-3 engine S/N E447007 (Ref. 7), significant differences were observed between the measured and calculated exhaust gas temperature and therefore, between the measured and calculated engine gross thrust. After investigations of these discrepancies, a thermal insulating blanket was installed on the engine tailpipe to reduce the tailpipe radiation heat losses. In addition, calculations were made of all of the unaccounted for radiation losses as well as the convection losses from the tailpipe to the secondary airstream. These calculations were made for the engine both with and without the thermal blanket installed, and the results are presented in Fig. 12. These curves were also inserted in the data reduction program (Appendix III) for engine S/N E447007 to correct the exhaust gas temperature (T8) for primary gas stream heat-transfer losses.

(C) A comparison can be made between the predicted and actual effects of the insulating blanket from the data obtained during the test of engine S/N E447007. From Fig. 12 at RNI2 = 0.063 (N altitude), values of T8/T51 of 0.9906 and 0.9690 were obtained, respectively, for the engine with and without the insulating blanket. The difference between these values is 0.0216, indicating a 2.2-percent predicted increase in T8/T51 (in the range from 101 to 107 PCN/RT) caused by reduced radiation losses when the thermal blanket is installed. Because the blanket did not extend downstream of station 55, the percentage increase in T8, caused by the reduced radiation losses with the blanket installed, should be the same as the percentage increase in T55.

(C) The engine pumping characteristics with and without the thermal blanket are compared in Fig. 13. The measured tailpipe static pressure and gas temperature were utilized in Fig. 13a. Both parameters were measured in the tailpipe near the downstream end of the thermal blanket (see Figs. 2 and 4c). At a constant corrected rotor speed of 106.7 PCN/RT, the measured T55 was 1.9 percent greater after the blanket was installed.

(C) The predicted T8 increase caused by reduced radiation losses was 2.2 percent. In addition, Fig. 13b indicates that the gas generator temperature and pressure ratios moved up along the operating line about 0.5 percent at a constant corrected rotor speed of 106.7 PCN/RT when the blanket was installed. Therefore, adding the 0.5-percent increase in cycle temperature to the 2.2-percent predicted increase in gas temperature caused by reduced radiation losses results in an estimated 2.7-percent increase in T55 and T8 compared with a measured 1.9-percent increase. The lower than predicted change in T55 can

probably be attributed to the geometry of the T55 thermocouple harness (Fig. 5e). The T55 thermocouples are all circumferentially located at a constant radius and, therefore, do not measure the radial profile or the temperature near the tailpipe wall where the largest increase in temperature would be expected. The effects of the blanket on tailpipe total pressure and net thrust can be projected from the estimated T8 increase (2.7-percent).

(C) Based on continuity, a 2.7-percent increase in T8 must be accompanied by a 1.35-percent increase in the tailpipe total pressure, P8. By applying the above estimated changes to the terms in the equations for calculated thrust (see Appendix III), the effect of the blanket installation (radiation and cycle changes) is estimated to be a 2.3-percent increase in net thrust. The scale force thrust data indicated that the blanket increased net thrust by 3.9 percent.

(C) The corrected engine fuel flow is presented in Fig. 14 for the engine with and without the tailpipe blanket at N altitude, Mach number 0.80. At PCN/RT = 107, the corrected fuel flow increased by 0.3 percent when the tailpipe blanket was installed.

4.6 SHAFT HORSEPOWER EXTRACTION

(U) A piston-type hydraulic pump was mounted on a customer drive pad of the engine gearbox to provide a means of extracting shaft horsepower from the engine during the performance test of engine S/N E447007 (Ref. 7). The back pressure on the pump discharge port was controlled with a throttling valve to obtain the desired horsepower. The horsepower extracted was calculated according to the equations in Appendix III of Ref. 7. It was not possible to reduce the shaft power extraction to zero with the pump installed because of friction and some inherent back pressure in the pump discharge line. During run 9 of the test of engine S/N E447007, the throttling valve was positioned in the full-open position for several conditions to determine the effects of shaft power extraction on engine performance. This reduced the shaft power extraction from the normal level of 17 to 4 hp.

(C) A limited comparison of the effects of shaft power extraction on engine thrust and SFC is presented in Fig. 15 for N altitude. At a corrected rotor speed of 107.3 percent, increasing the power extraction by 13 hp (from 4 to 17 hp) increased the engine net thrust by 1.8 percent and SFC by 1.7 percent. These data compare favorably with the estimated effects of power extraction (2.1-percent thrust increase and 1.7-percent SFC increase) from the Estimated Performance tables of the engine specification (Ref. 6).

4.7 SWIRL ANGLE INVESTIGATION

(U) An exhaust gas swirl angle investigation was conducted to determine the loss in gross thrust due to flow angularity. Measurements were taken at two stations, approximately 1 in. downstream of the secondary exhaust plane on engine S/N E447007 and in the primary exhaust plane on engine S/N E447052 (Fig. 16).

(U) Swirl angle measurements were normally made from the nozzle centerline vertically to the nozzle outer wall. However, during one test period, to check swirl symmetry about the nozzle centerline, in the plane of the primary nozzle, the probe travel was extended approximately 2 in. Measurements verified that flow symmetry does exist as shown in Fig. 17.

(C) The methods used to calculate the average swirl angle and to correlate the swirl angles in the secondary and primary planes are shown in Appendix III. A comparison of primary and secondary nozzle exhaust flow angularity at N altitude is presented in Fig. 17. In the plane of the secondary nozzle, the maximum measured swirl angle was approximately 2.7 deg, and the average absolute value was 1.72 deg. At the primary nozzle exit, the maximum measured value was 6.4 deg, and the average absolute value was 3.95 deg.

(U) The average measured swirl angle in the plane of the primary nozzle exit (3.95 deg from engine S/N 447052) is in reasonable agreement with the swirl angle at the primary nozzle exit calculated from measurements at the secondary nozzle exit (3.66 deg from engine S/N 447007 and Appendix III).

(U) A correction for swirl angle must be applied to the primary exhaust gas velocity term in the momentum balance thrust equation (Appendix III). Based on an average primary nozzle exit swirl angle of 3.95 deg, the primary exhaust gas velocity correction was -0.24 percent, and the resulting correction to primary gross thrust was -0.17 percent.

(U) The variation in swirl angle at the secondary nozzle exit and the range of operational levels during which measurements were made are shown in Fig. 18. The bandwidth was no greater than 1.1 deg. No correlation could be established between the swirl angle pattern and changes in altitude, Mach number, engine speed, or horsepower extraction.

4.8 PRIMARY EXHAUST NOZZLE TOTAL PRESSURF

(U) The primary exhaust nozzle inlet total pressure (P7) was obtained from an empirically determined curve of P7/P52 versus RN8 (Fig. III-3), a measured value of tailpipe entrance pressure (P52), and the calculated nozzle throat Reynolds number (RN8). To verify the validity of this curve, a 12-probe equal area total pressure rake was fabricated, which could be inserted into the exhaust nozzle and withdrawn during testing (Fig. 16). This rake was withdrawn for all performance test points and inserted to measure the pressure 0.5 in. upstream of the nozzle exit plane at each test condition where data were desired.

(C) The arithmetic average of the measured primary nozzle exit pressure (P8) is compared with the predicted P7 from the empirical curve of P7/P52 in Fig. 19. The values of P7 and P8 agree within 0.5 percent at N and N + 5000 ft and 0.8 percent at N - 10,000 ft. The agreement became poorer as altitude was decreased, and the measured P8 was approximately 1.5 percent less than the predicted P7 at N - 35,000-ft altitude — the lowest altitude where data are available. A line comparing the integrated average of the measured P8 with the predicted P7 is included in Fig. 19. The integrated average P8 is approximately 1 and 0.5 percent below the arithmetic average at N + 5000 and N - 35,000 ft, respectively.

(C) A comparison of nozzle total pressure (P7X) (calculated from measurement of PS7 and T55 and an empirically determined tailpipe flow coefficient, Fig. III-4) with the predicted P7 is also presented in Fig. 19.

(C) Typical nozzle exit total pressure profiles at N + 5000 and N - 35,000 ft, obtained with the P8 rake installed, are presented in Fig. 20. The dip in the center of the profile is caused by the centerbody in the turbine exit diffuser and is less pronounced at N - 35,000 ft than at N + 5000 ft.

4.9 PRIMARY NOZZLE THRUST COEFFICIENT

(C) The primary nozzle gross thrust coefficient for engine S/N E447052 (A8H = 141 in.^{2}) is presented in Fig. 21 as a function of nozzle pressure ratio. The thrust coefficient is defined as the ratio of the measured (scale force) engine gross thrust (FJS) to the ideal gross thrust for a convergent-divergent nozzle (FJISEN). The thrust coefficient decreased from approximately 0.985 at $P7/P_o$ = 3.6 (N - 35,000 ft) to 0.95 at $P7/P_o$ = 5.3 (N + 5000 ft).

(C) The primary nozzle thrust coefficients predicted by the engine manufacturer for maximum and minimum levels of test Reynolds number (RN8) are also presented for comparison (GE curves J97PA-233-13, 6-16-67, and ESHA-CDE-67-86, 11-11-67). The test values of CFG are lower than the manufacturer's predicted values at all test conditions; 0.3 percent lower at $P7/P_o = 3.7$ (RN8 = 9×10^5), 0.6 percent lower at $P7/P_o = 4.5$ (RN8 = 2×10^5), and 1.0 percent lower at $P7/P_o = 5.2$ (RN8 = 1.2×10^5). The Reynolds number effects on CFG for the test data are in good agreement with the predicted Reynolds number effects. At $P7/P_o = 4.0$, the effect of decreasing RN8 from 9×10^5 to 2×10^5 is a 0.4-percent decrease in CFG compared with the predicted 0.5-percent decrease. At $P7/P_o = 4.8$, the effect of decreasing RN8 from 2×10^5 to 1.2×10^5 is a 0.4-percent decrease in CFG compared with the predicted 0.3-percent decrease.

(C) If the data in Fig. 21 were recalculated using the integrated average values of P8 (Figs. 19 and 20), the thrust coefficient curves would be shifted upward approximately 0.4 percent at N + 5000 ft and 0.5 percent at N - 35,000 ft. This would improve the agreement with the predicted curves to within approximately 0.5 percent at all test conditions.

SECTION V
SUMMARY OF RESULTS

(C) The results of the altitude endurance test of J97-GE-3 engine S/N 447052 and the special investigations on engines S/N E447007 and E447052 are summarized as follows:

(C) 1. The 4-hr engine endurance run at N + 5000-ft altitude, Mach number 0.85, and rated turbine inlet temperature (2710°R) was successfully completed on J97-GE-3 engine S/N E447052.

(C) 2. J97-GE-3 engine S/N 447052 was tested for 19 hr, 18 min, during which the maximum observed vibration levels were 0.9 and 2.1 mils on the compressor front and rear frames, respectively.

(C) 3. The increase in engine heat rejection to the oil-water cooler, as a result of removing the number 3 bearing sump insulation blanket, was approximately 100 Btu/min at N + 5000 ft, Mach number 0.85, 106.1 PCN/RT.

(C) 4. J97-GE-3 engine S/N E447052 had a 1.5-percent lower specific fuel consumption than engine S/N E447007 at N altitude, Mach number 0.80, 107 PCN/RT.

(C) 5. A thermal insulating blanket was added to the tailpipe. The predicted T8 increase caused by reduced radiation losses was 2.2 percent. The addition of the blanket also caused a 0.5-percent shift in operating point for a net T8 increase of 2.7 percent at N altitude, Mach number 0.80, 107 PCN/RT.

(U) 6. The actual effects on engine thrust of shaft power extraction compare favorably with the values from the estimated performance tables of the Model Specification (Ref. 6). At N altitude, Mach number 0.80, for a 13-hp increase in shaft power extraction, actual net thrust and SFC increased 1.8 and 1.7 percent, respectively, compared with estimated increases of 2.1 and 1.7 percent.

(U) 7. The integrated absolute average swirl angle at the primary nozzle exit was 3 to 4 deg counterclockwise (looking upstream).

(U) 8. The primary nozzle isentropic thrust coefficient for engine E447052 varied from 0.985 at $P7/P_O$ = 3.6 to 0.95 at $P7/P_O$ = 5.3 and agreed with the manufacturer's predicted values within 1 percent at all test conditions.

REFERENCES

1. Kistler, S. M. and Beach, D. W. "An Operational and Performance Demonstration of a GE1 Turbojet Engine in an Altitude Test Cell." (U) AEDC-TR-66-165, November 1966. Confidential Report.

2. Edmunds, E. W. and Turrentine, W. A. "Operation and Performance of a GE1 Turbojet Engine at Various Simulated Flight Conditions." (U) AEDC-TR-67-14 (AD379562L), March 1967. Confidential Report.

3. Turrentine, W. A. and Kimzey, W. F. "An Investigation of the GE1 Turbojet Engine Compressor Performance at Simulated Flight Conditions." (U) AEDC-TR-67-137 (AD383888L), September 1967. Confidential Report.

4. Faehl, K. C. and Chamblee, C. E. "Performance of the YJ97-GE-3 Turbojet Engine (S/N 424005/2) at Simulated High Altitudes." (U) AEDC-TR-68-107 (AD391683L), July 1968. Confidential Report.

5. Warwick, W. R., Hartsfield, B. W., and Overall, B. W. "Altitude Performance Test of the YJ97-GE-3 Turbojet Engine (S/N 447051) with a Secondary Ejector Nozzle." (U) AEDC-TR-68-122, October 1968. Confidential Report.

6. General Electric Company. "Engine Model Specification No. E-2054 for YJ97-1 and YJ97-3 Engines." (U) Flight Propulsion Division, August 1, 1966, Revised January 2, 1968. Confidential Report.

7. Warwick, W. R., Hartsfield, B. W., and Overall, B. W. "High Altitude Performance Test of the YJ97-GE-3 Turbojet Engine (S/N E447007) (Part I)." (U) AEDC-TR-68-167, October 1968. Confidential Report.

8. General Electric Company. "J97 Stage Two-Disc Failure on Engine 447007/1." (U) General Electric Technical Memorandum TM No. TM68AEG1748, June 14, 1968. Confidential Proprietary Report.

9. Test Facilities Handbook (7th Edition). "Rocket Test Facility, Vol. 2." Arnold Engineering Development Center, July 1968.

10. National Aeronautics and Space Administration, United States Air Force, United States Weather Bureau. U. S. Standard Atmosphere, 1962. December 1962, Washington, D. C.

11. Smith, Robert E., Jr., and Matz, Roy J. "Verification of a Theoretical Method of Determining Discharge Coefficients for Venturis Operating at Critical Flow Conditions." AEDC-TR-61-8 (AD263714), September 1961.

12. Glawe, George E., Simmons, Frederick S., and Stickney, Truman M. "Radiation and Recovery Corrections and Time Constants of Several Chromel-Alumel Thermocouple Probes in High-Temperature, High-Velocity Gas Streams." Lewis Flight Propulsion Laboratory, NACA TN 3766, October 1956.

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APPENDIXES

I. ILLUSTRATIONS
II. TABLES
III. METHODS OF CALCULATIONS
IV. TABULATED STEADY-STATE DATA

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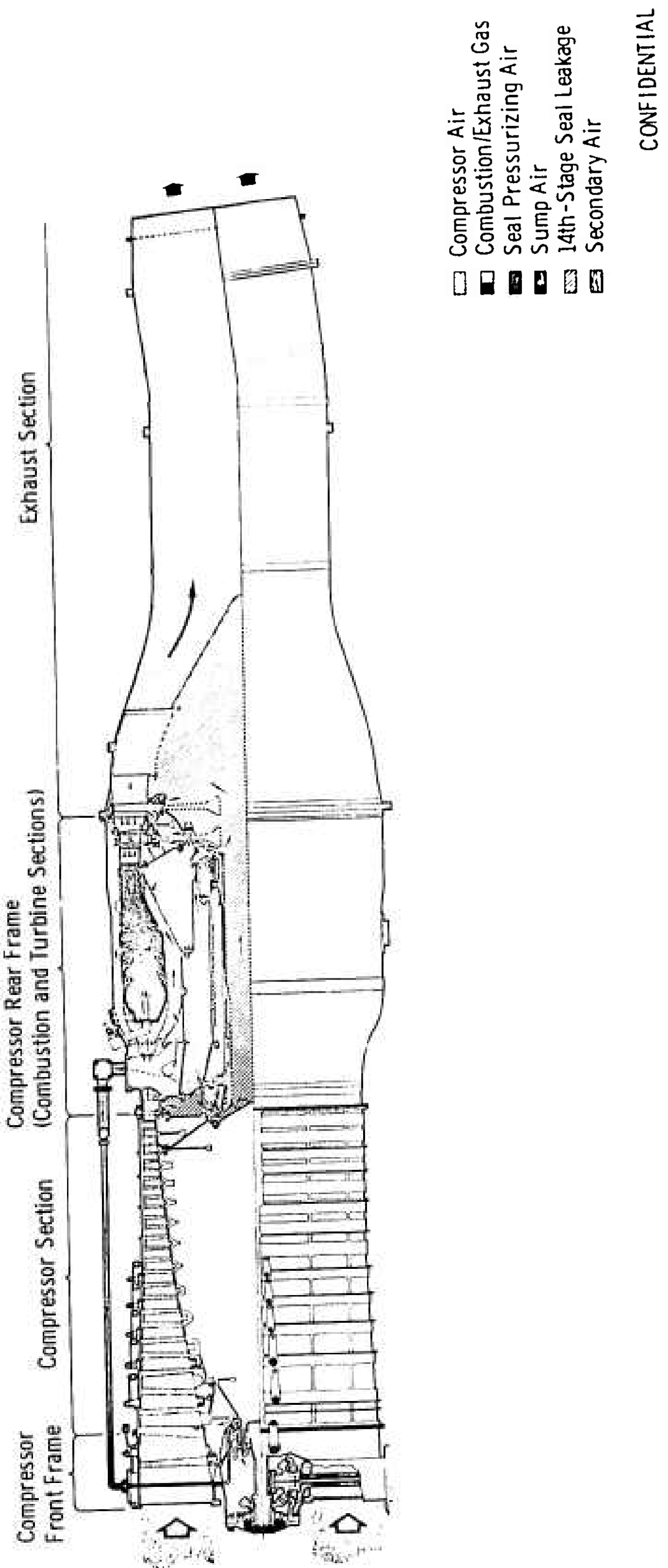

(U) Fig. 1 YJ97-GE-3 Engine Schematic

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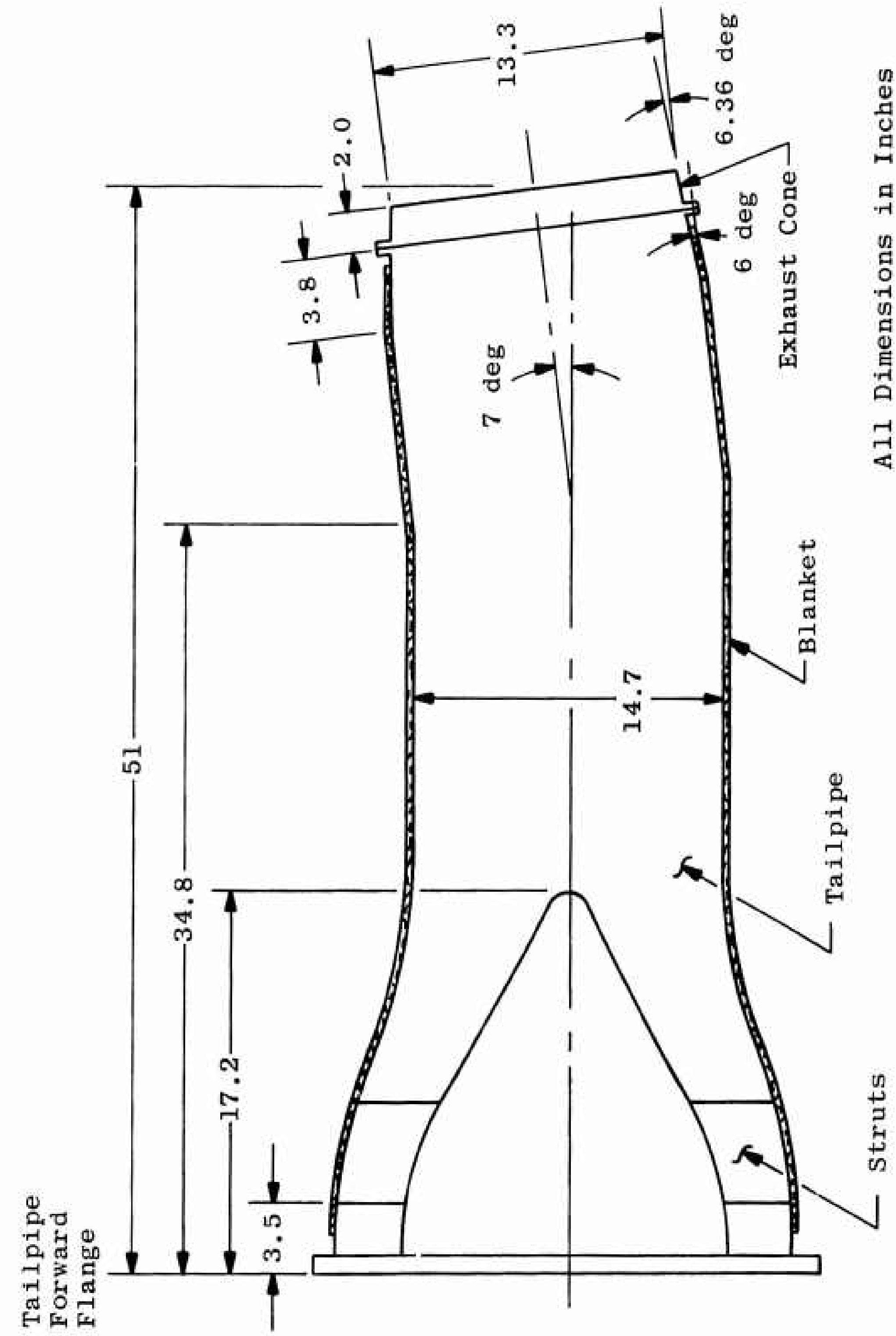

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(U) Fig. 2 Tailpipe and Exhaust Cone

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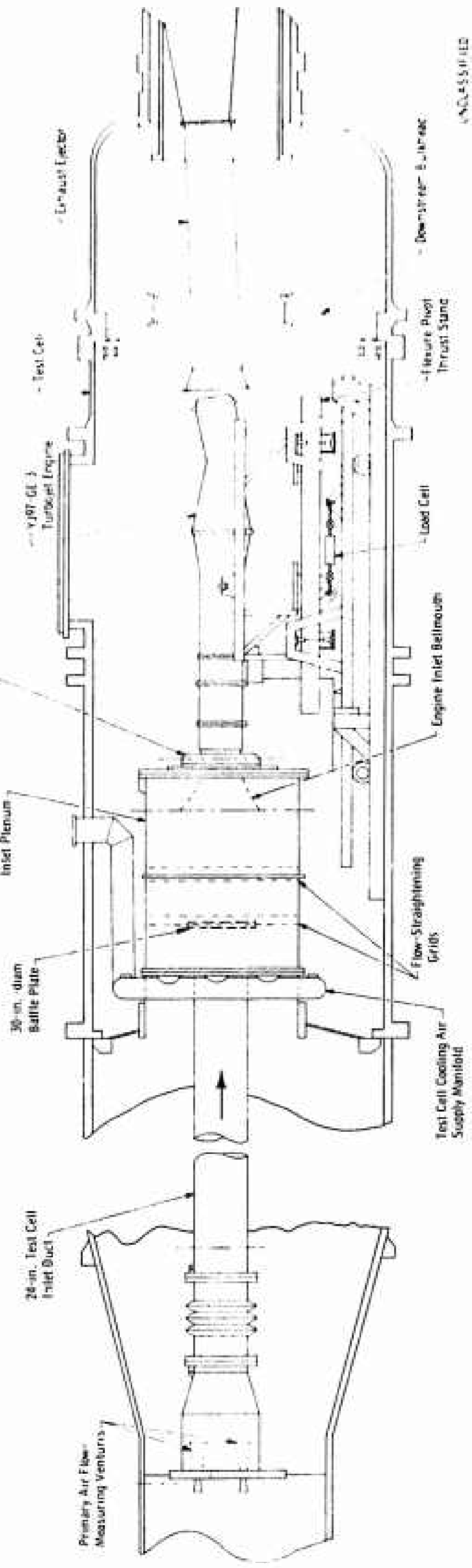
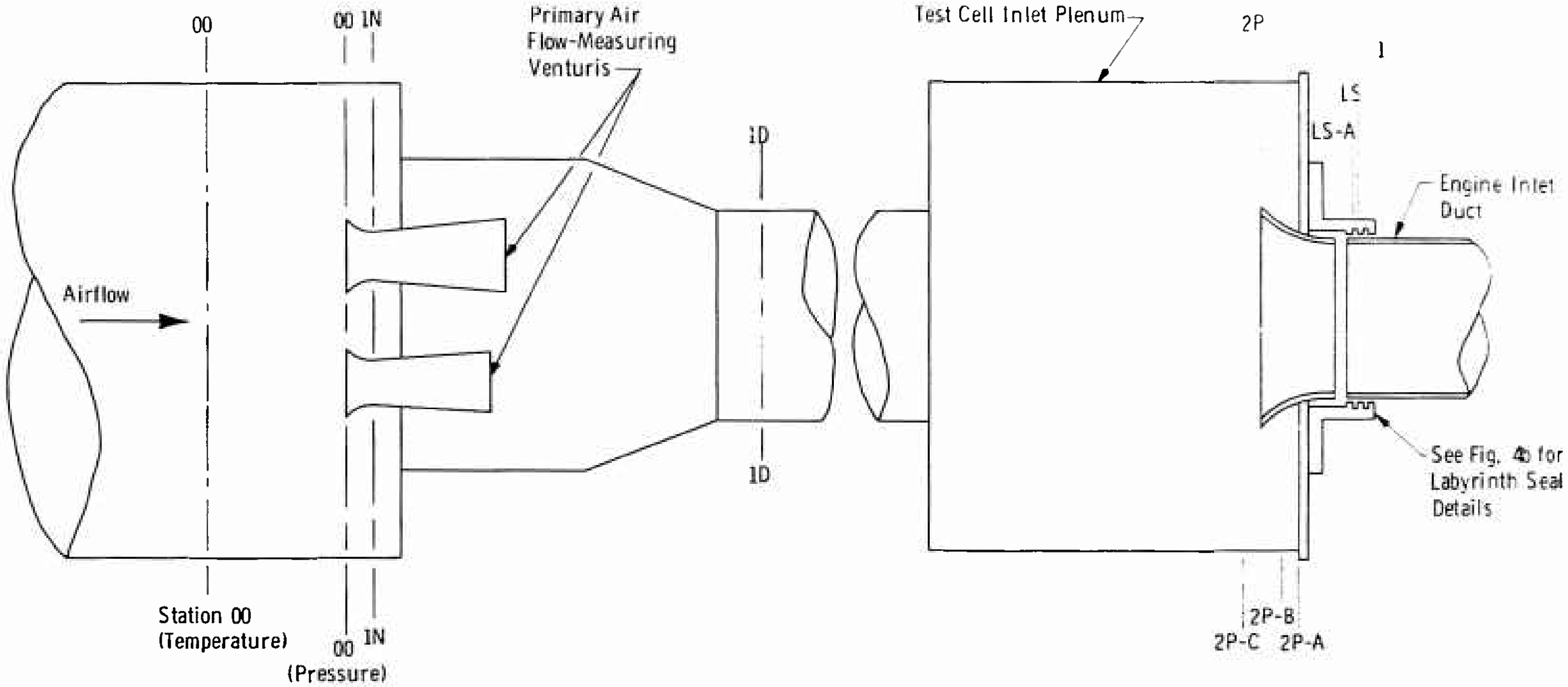


(U) Fig. 3 Installation of the YJ97-GE-3 Turbojet Engine in Propulsion Engine Test Cell (T-4)



Station	00	1N	1D	2P	LS-A	LS	1	2P-A	2P-B	2P-C
Total Pressure	3	~	~	3		~	~	1	~	~
Stream Static Pressure	~	~	~	~	2	~	~	~	~	~
Wall Static Pressure	~	8	~	~		4	4	~	1	1
Total Temperature	6	~	6	~		~	~	~	~	~
External Wall Temperature	~	~	~	~		~	~	~	~	~

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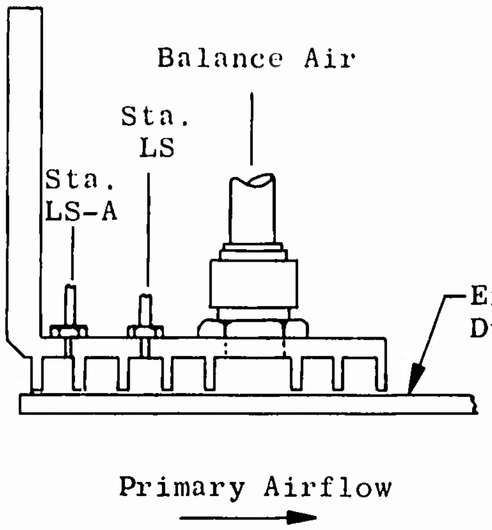
a. Primary Air Supply System

(U) Fig. 4 Instrumentation Station Locations



Balance Air Controlled to Maintain
Δ(PLS-PLS-A) = 0

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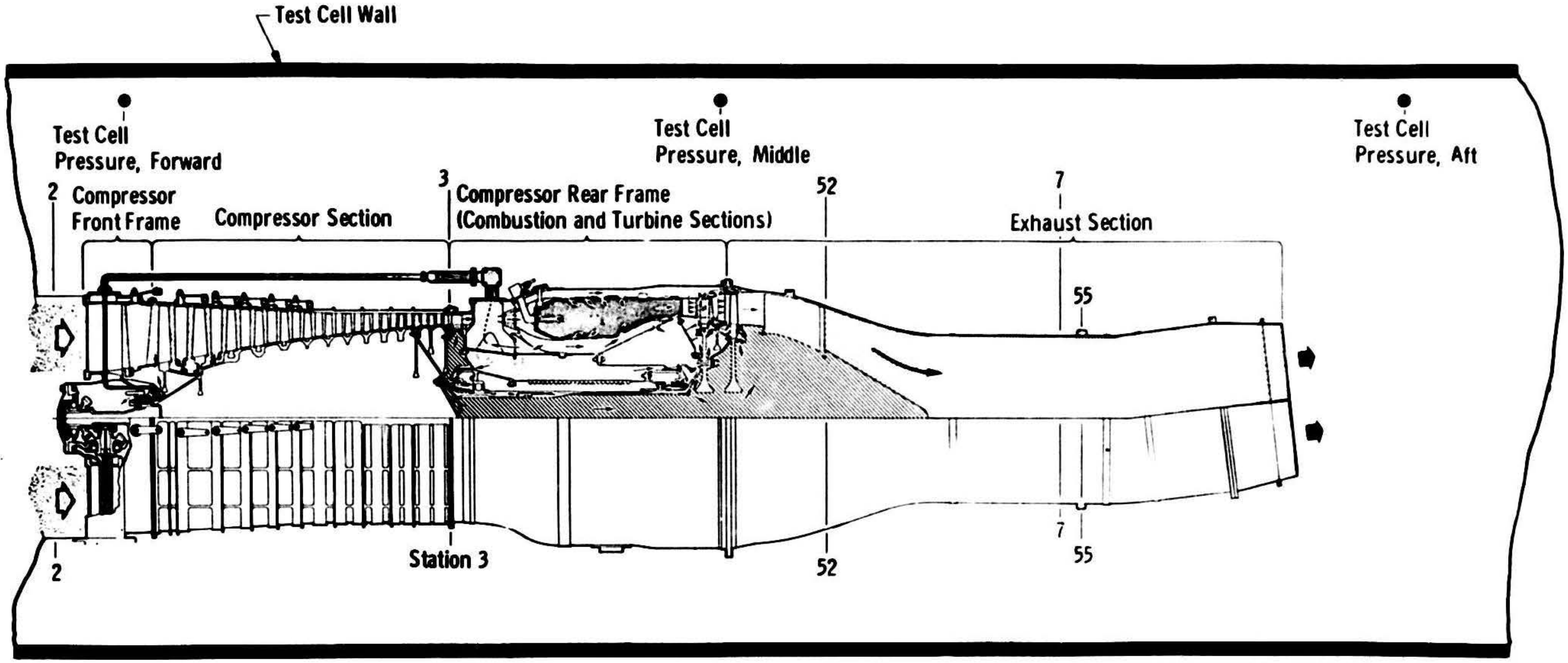
b. Engine Inlet Duct Labyrinth Seal

Fig. 4 Continued



Station	2	3	52	55	7	Test Cell, Forward	Test Cell, Middle	Test Cell, Aft
Total Pressure	30	25	10	~	~	~	~	~
Stream Static Pressure	24	~	~	~	4	~	~	~
Wall Static Pressure	~	5	~	~	~	1	1	1
Total Temperature	24	25	~	16	~	~	~	~

Compressor Air
Combustion/Exhaust Gas
Seal Pressurizing Air
Sump Air
14th-Stage Seal Leakage
Secondary Air

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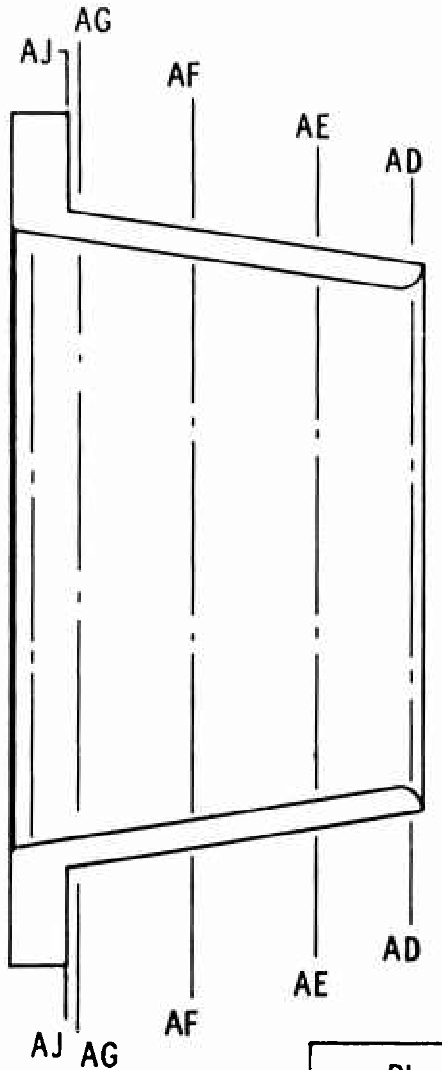
c. Engine
Fig. 4 Continued



Plane	Distance from Nozzle Exit Plane, in.
AJ	2.1
AG	2.0
AF	1.2
AE	0.5
AD	0.1

Plane	AJ	AG	AF	AE	AD
Internal Static Pressure	~	~	~	~	4
External Static Pressure	~	5	1	2	2
External Skin Temperature	4	4	~	~	4

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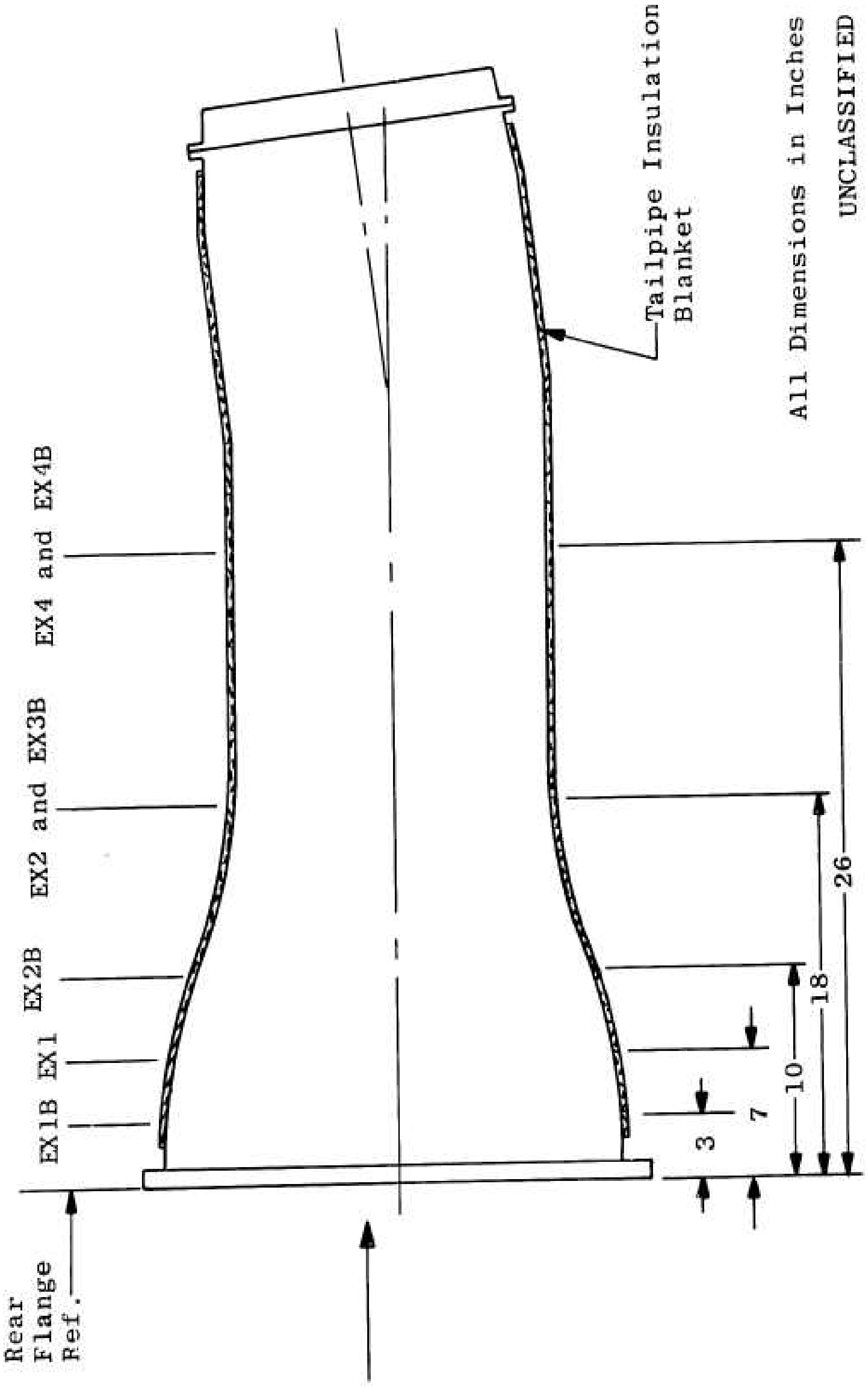
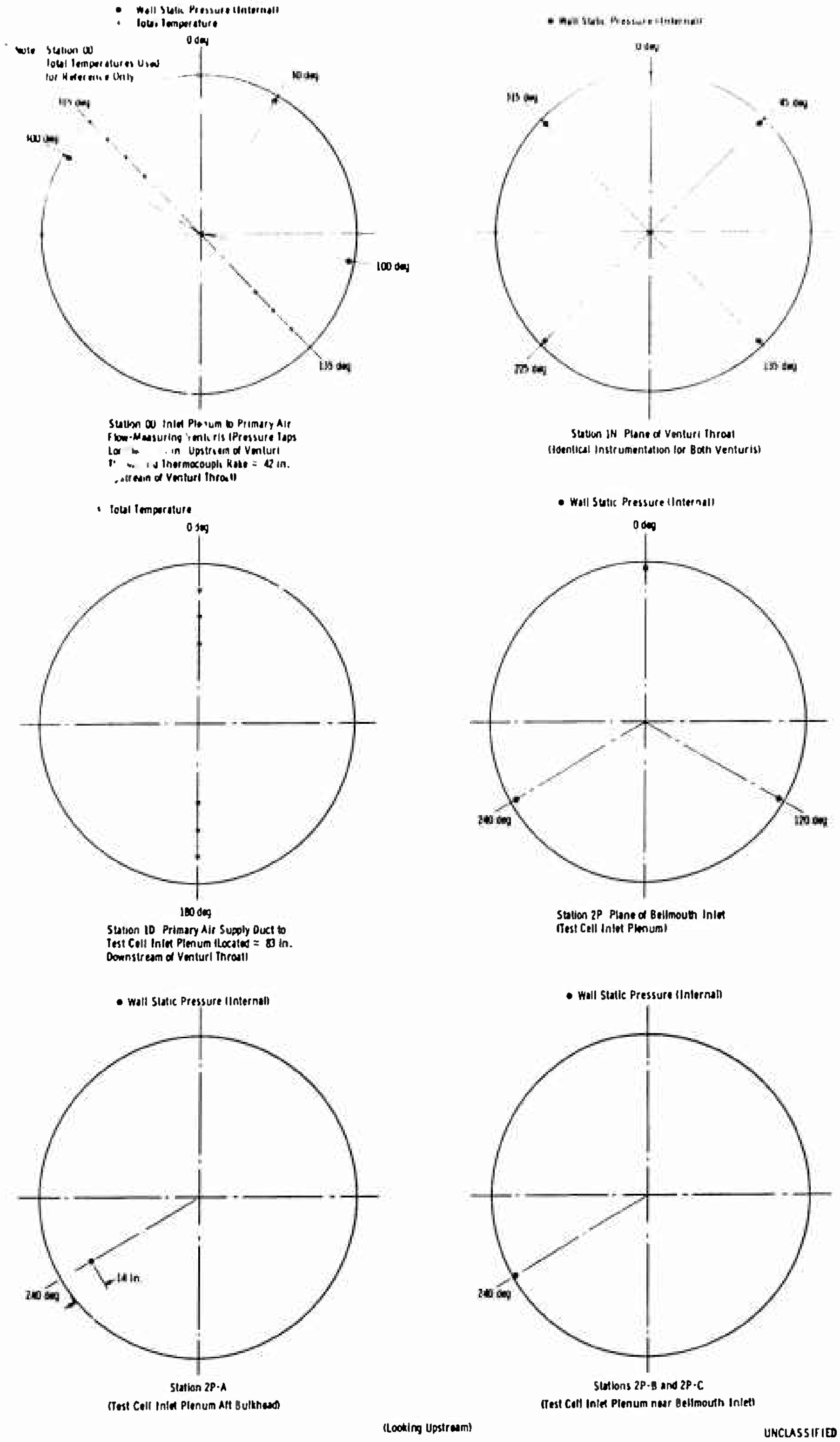
d. Primary Exhaust Nozzle Cone

Fig. 4 Continued

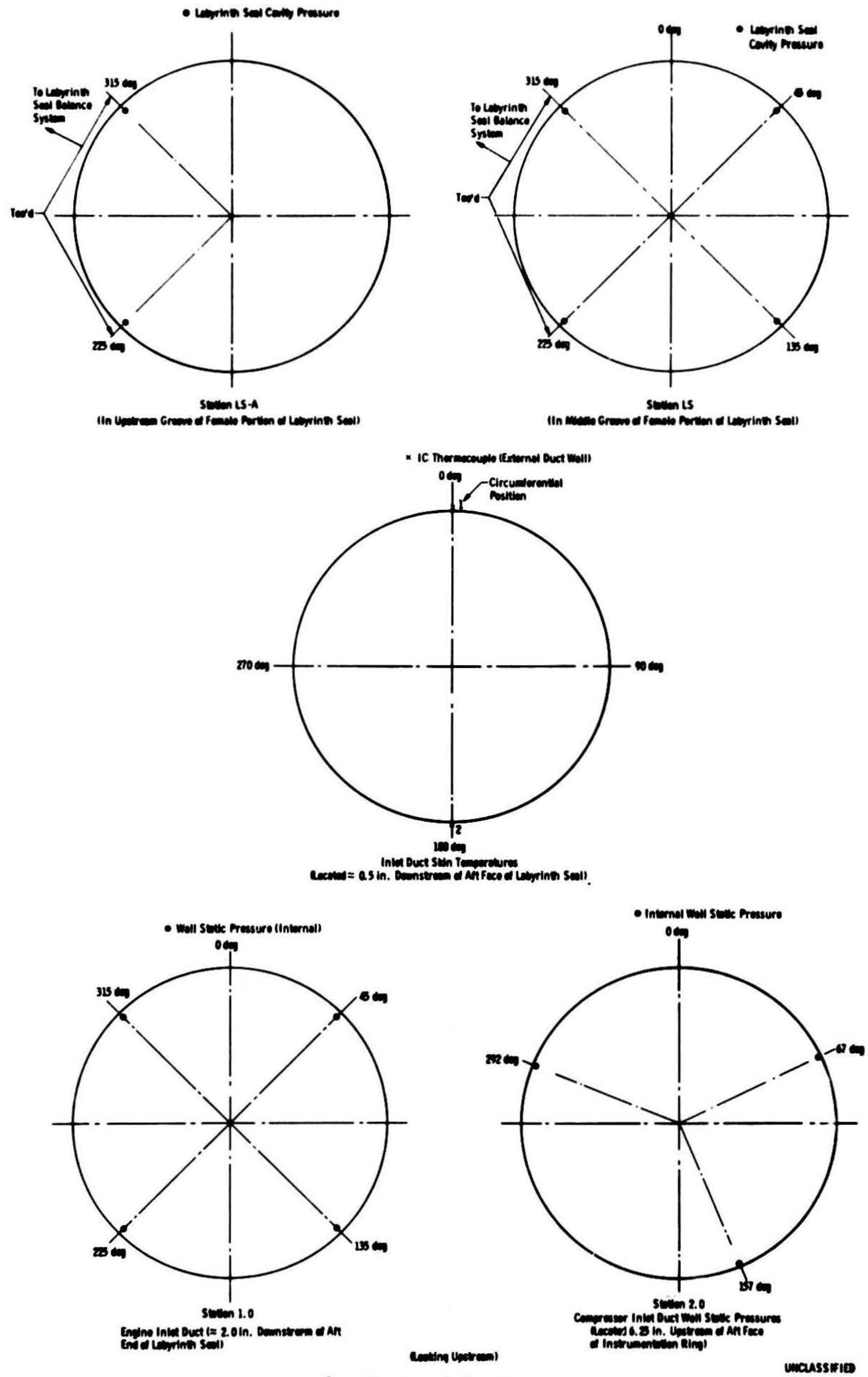


e. Tailpipe and Insulation Blanket
Fig. 4 Concluded



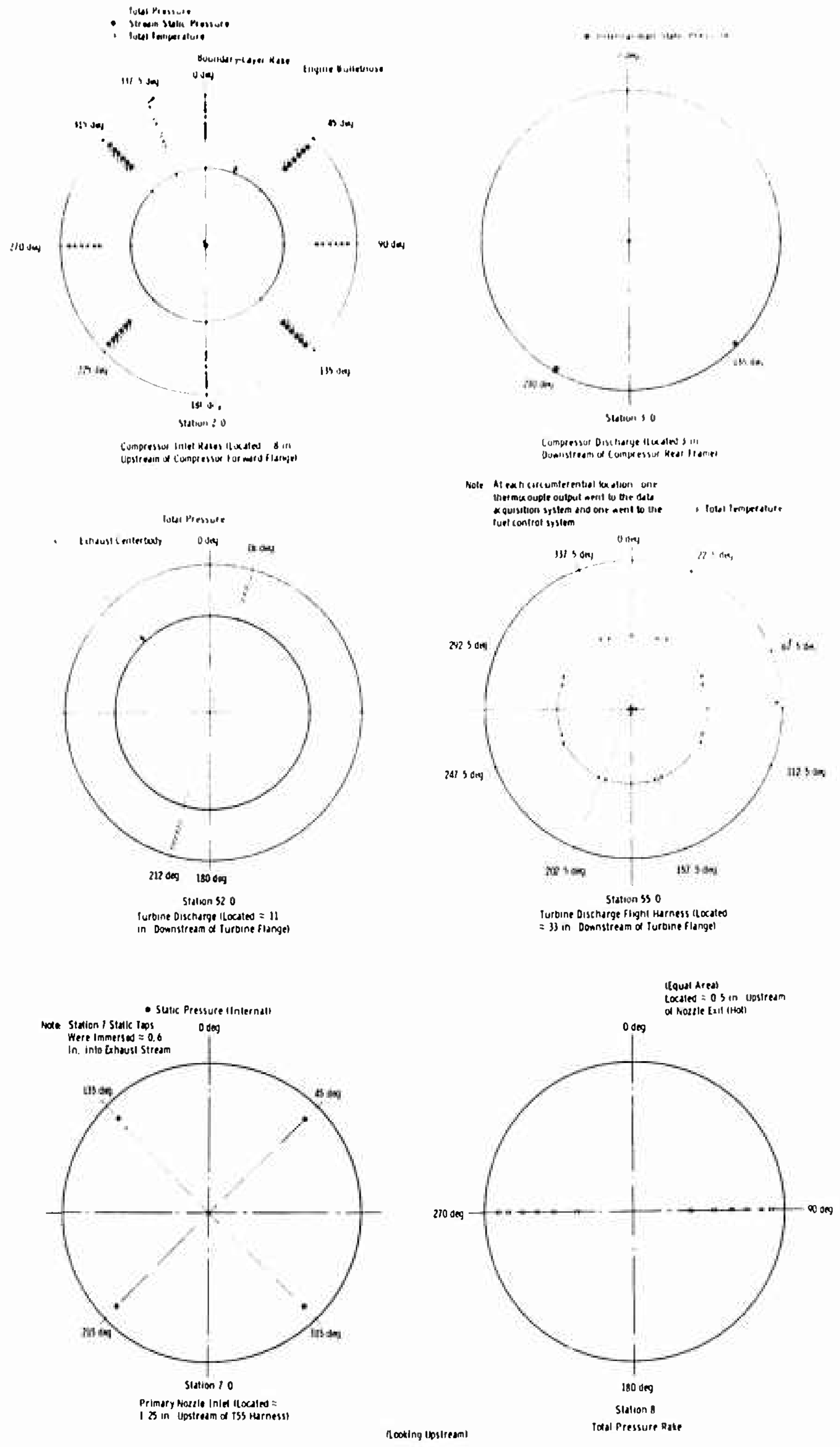
a. Primary Air Supply System

(U) Fig. 5 Instrumentation Details



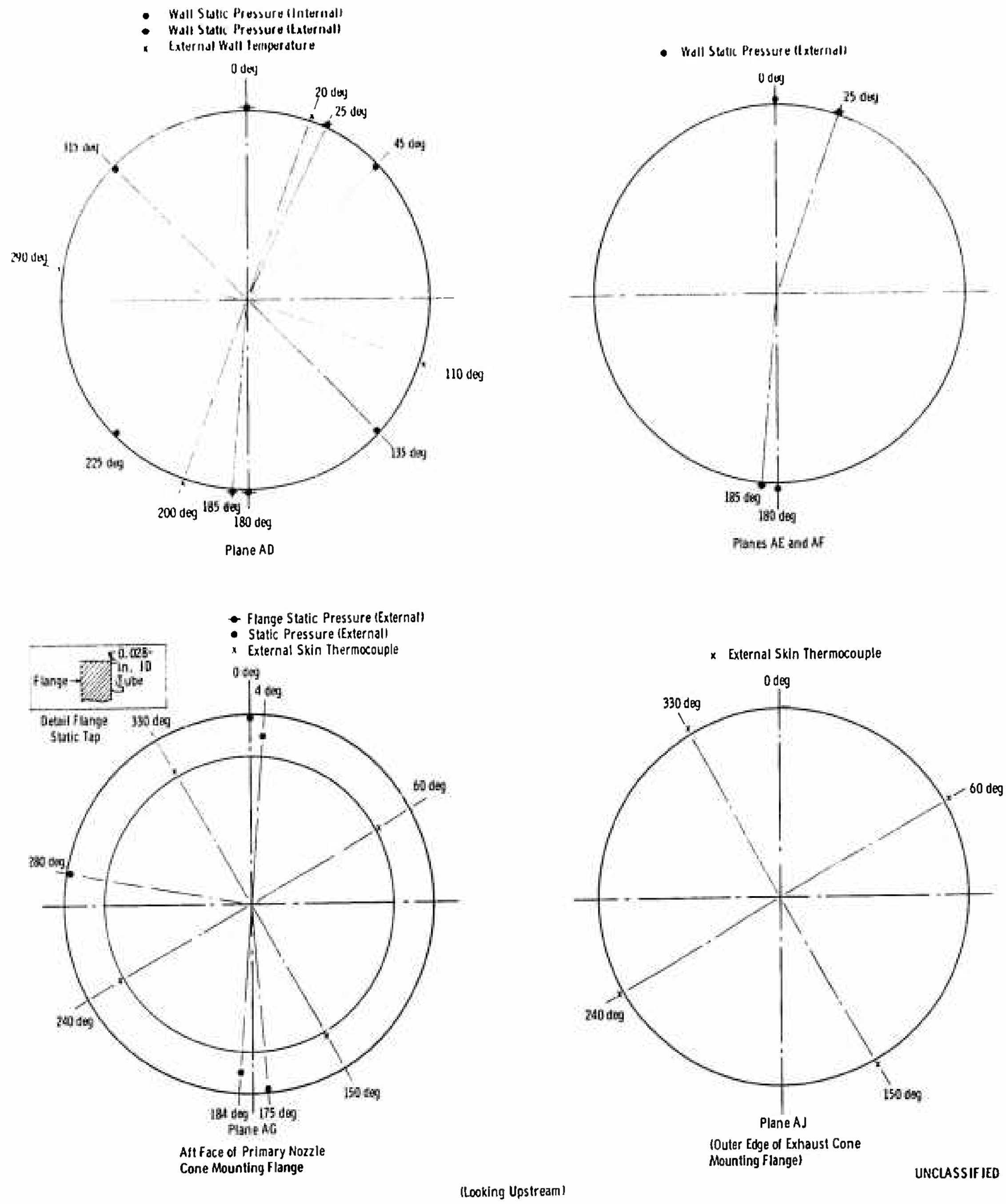
b. Engine Inlet Duct

Fig. 5 Continued



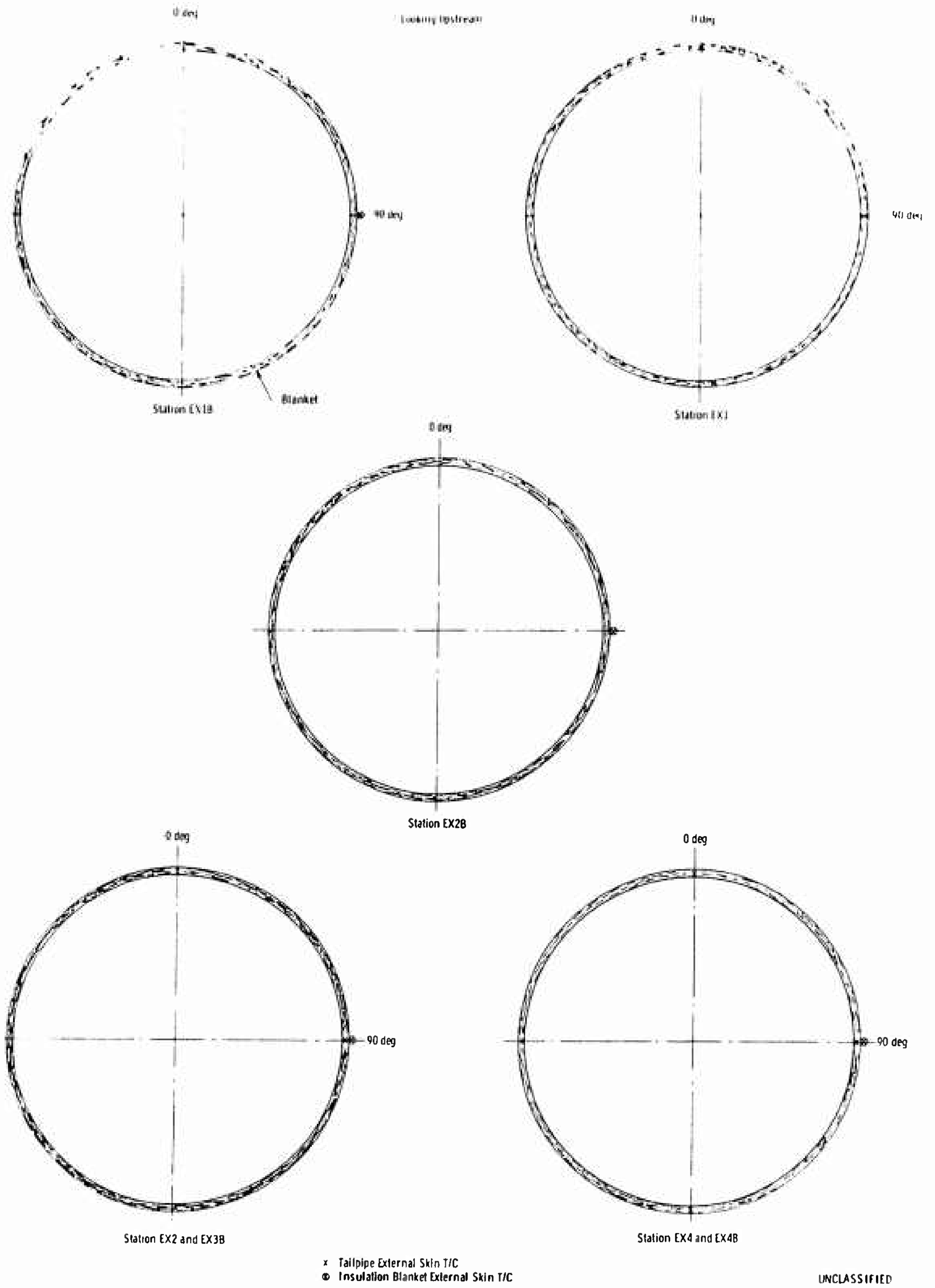
c. Engine

Fig. 5 Continued

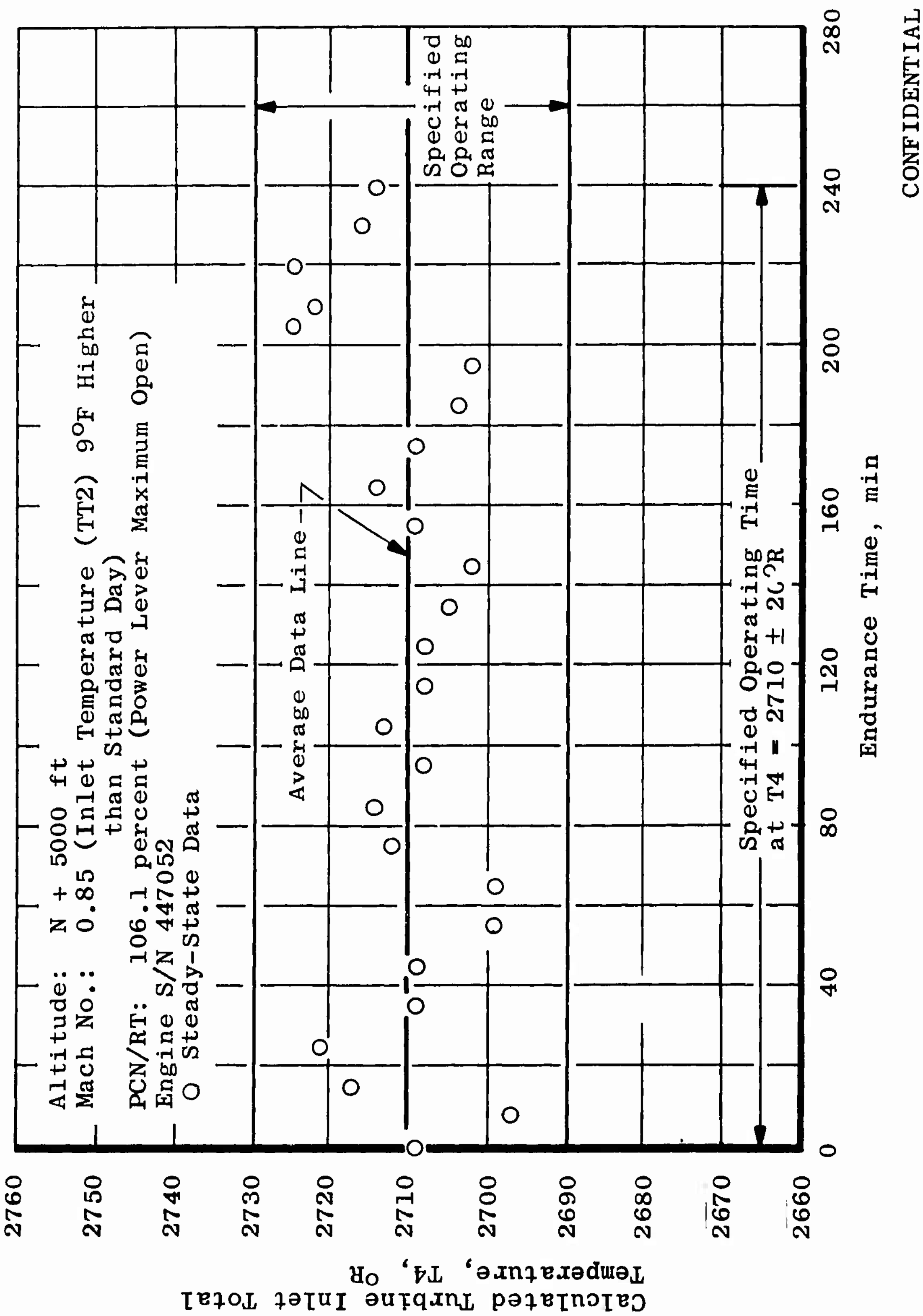


d. Primary Exhaust Nozzle Cone

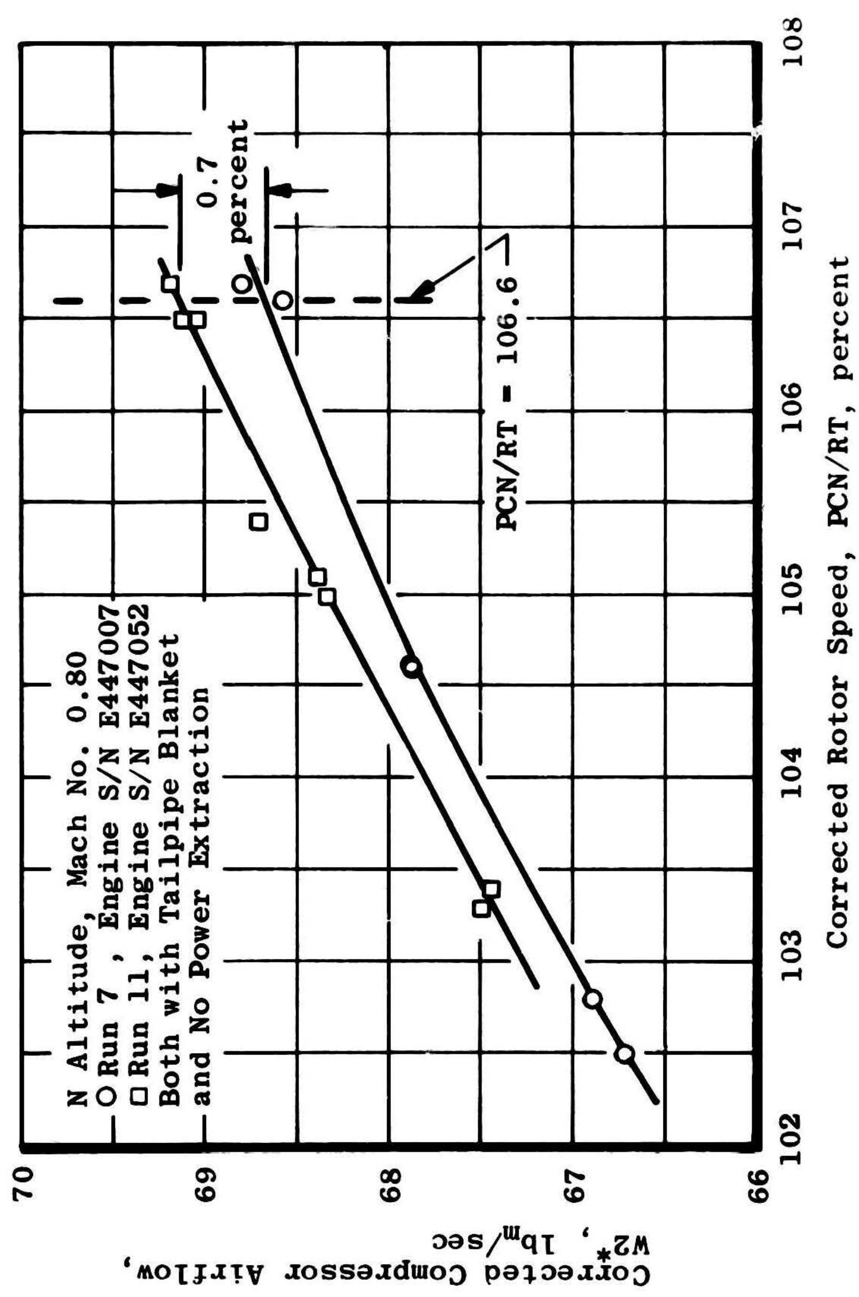
Fig. 5 Continued



e. Tailpipe and Insulation Blanket
Fig. 5 Concluded



(U) Fig. 6 Calculated Turbine Inlet Total Temperature during the Endurance Cycle



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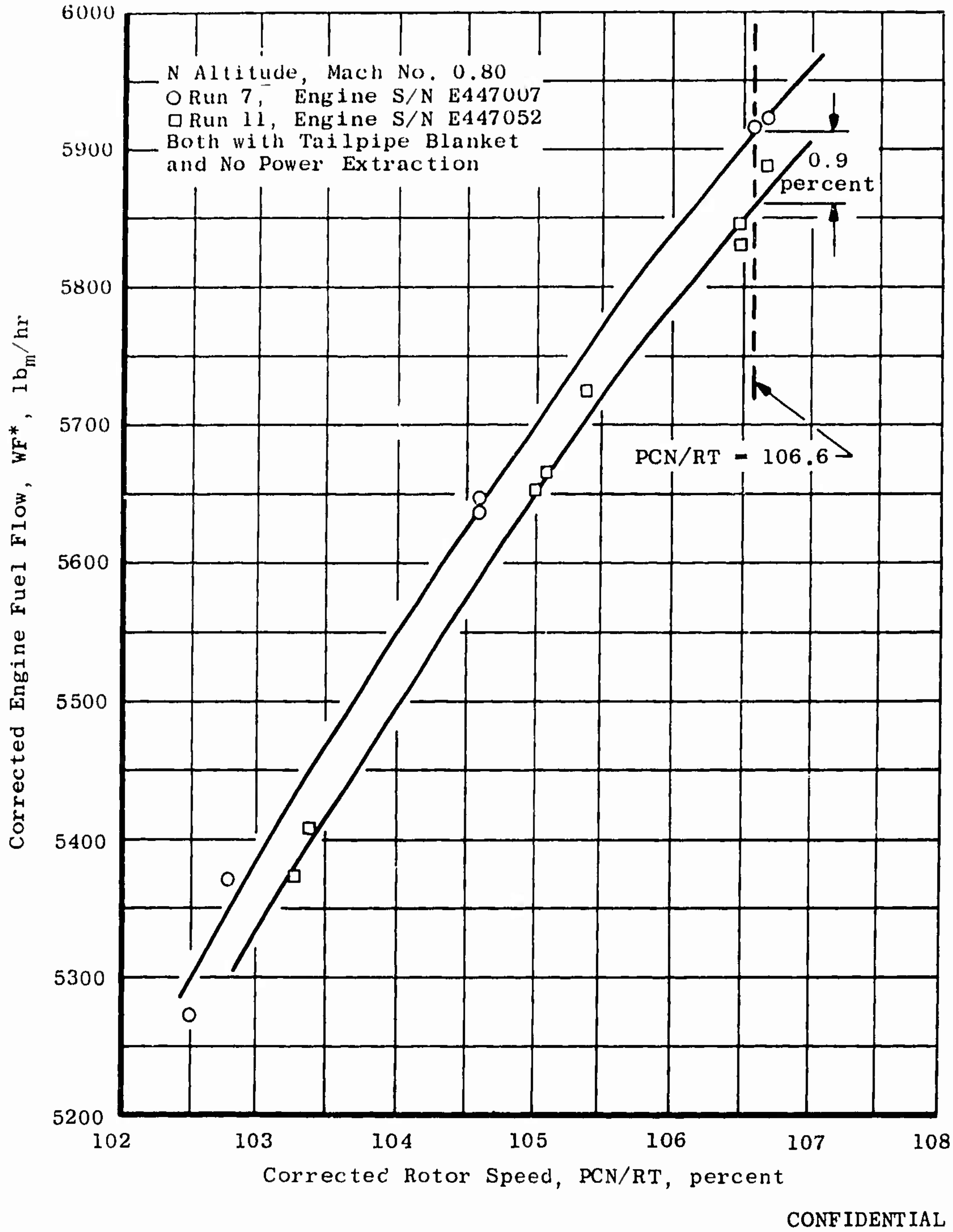
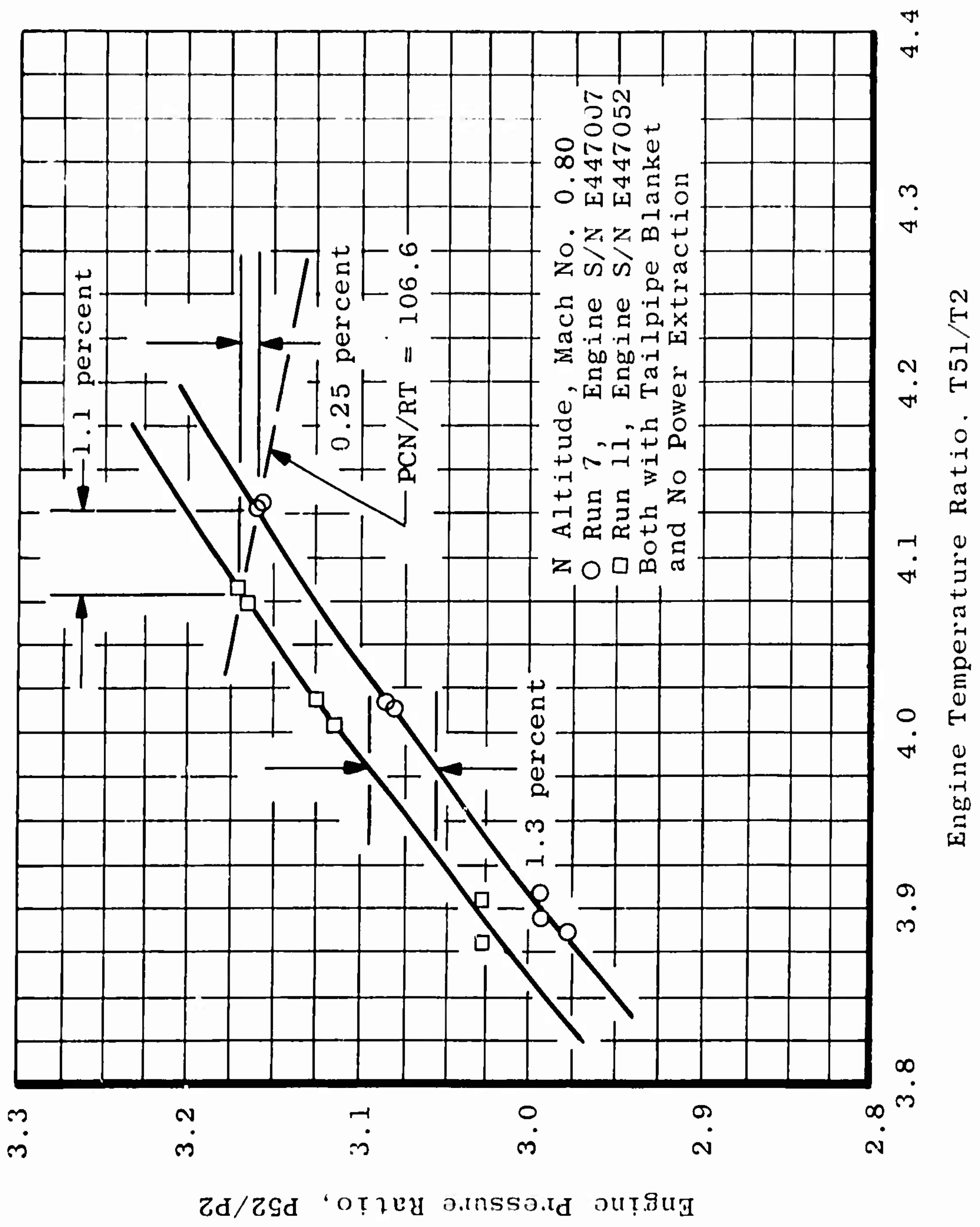
(U) Fig. 7 Comparison of Airflow of J97 Engines S/N E447007 and E447052



(U) Fig. 8 Comparison of Fuel Flow of J97 Engines S/N E447007 and E447052



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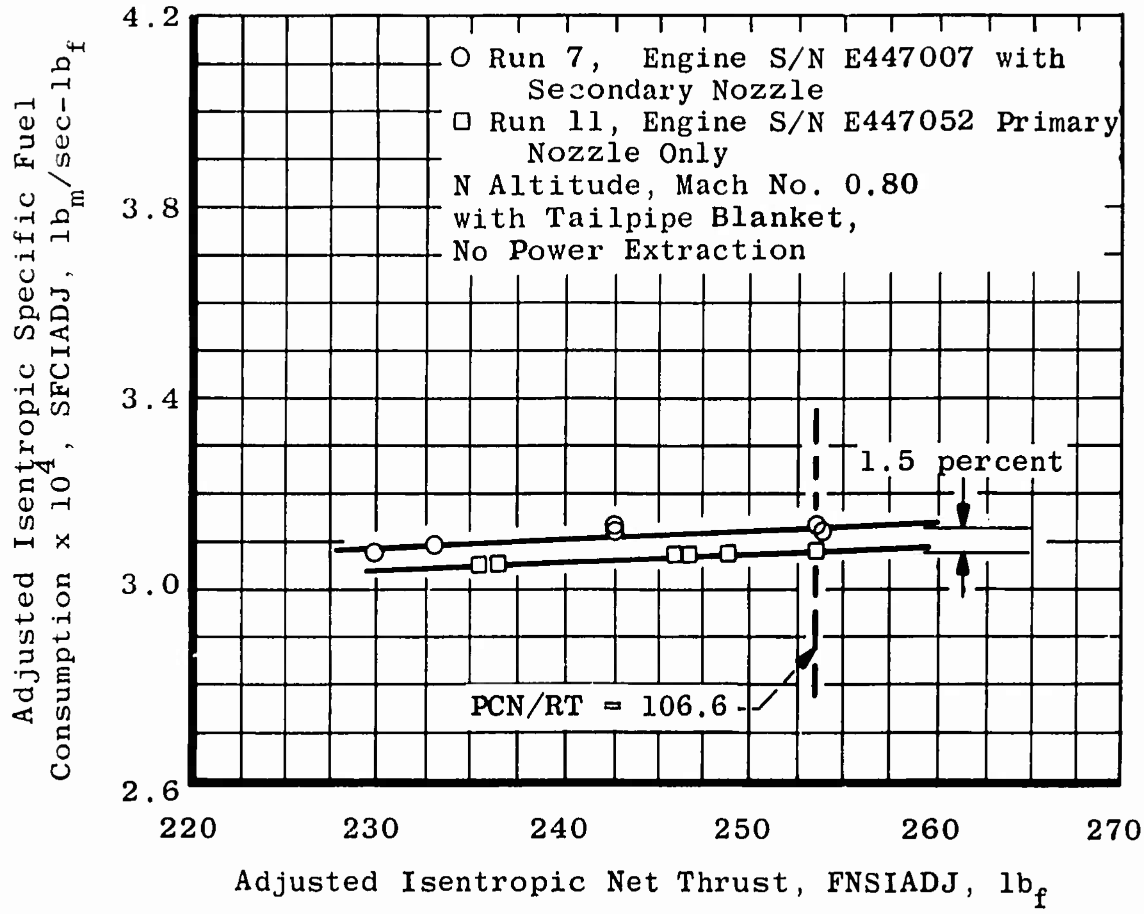
(U) Fig. 9 Comparison of Pumping Characteristics of J97 Engines S/N E447007 and E447052



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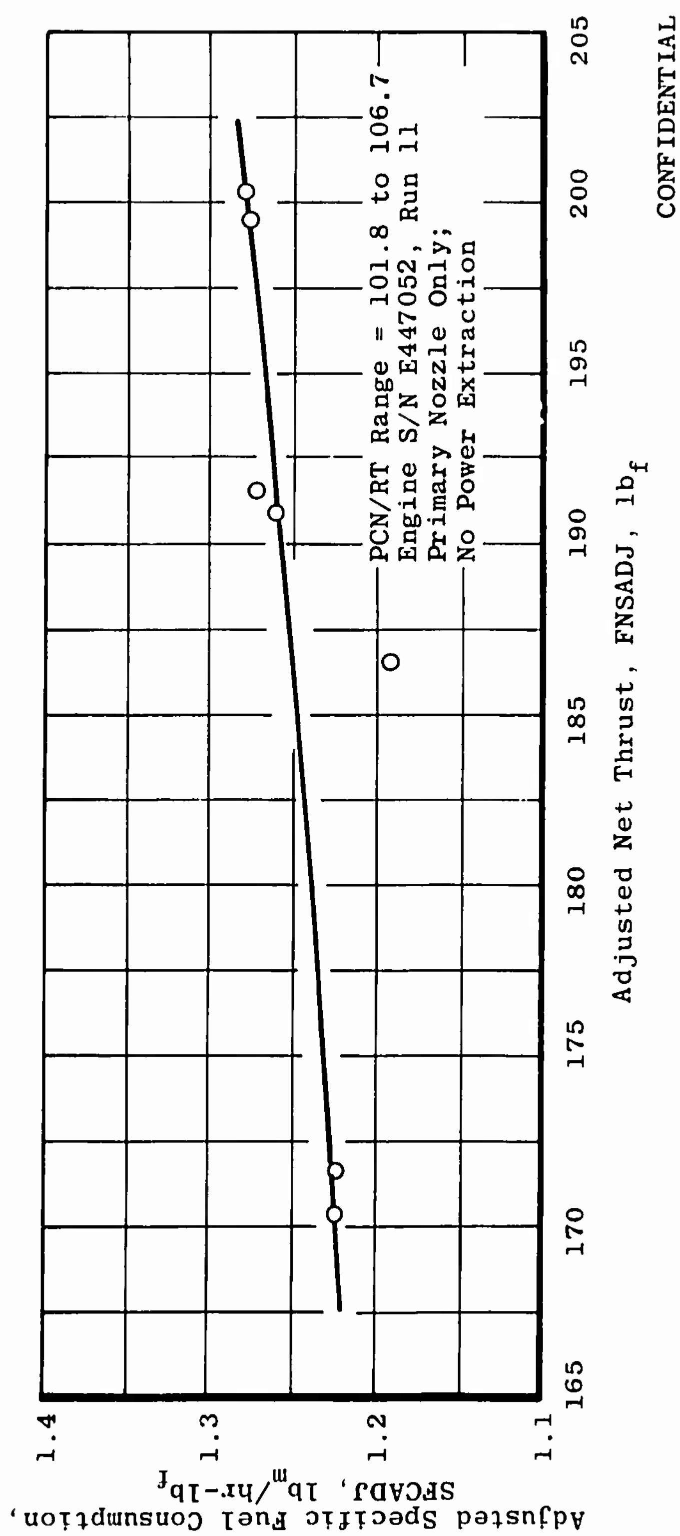
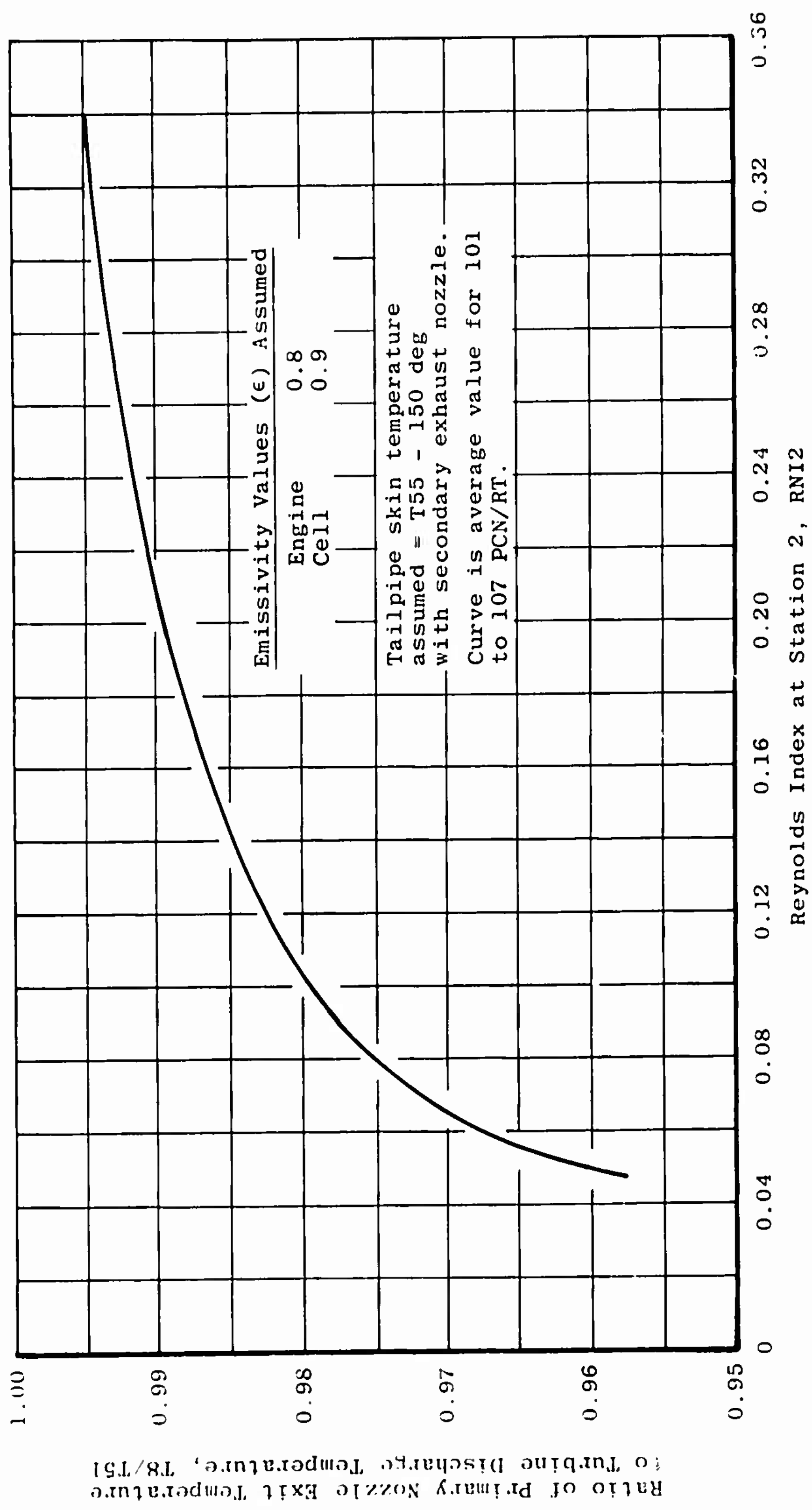
(U) Fig. 10 Comparison of Specific Fuel Consumption of J97 Engines S/N E447007 and E447052



(C) Fig. 11 Specific Fuel Consumption as a Function of Net Thrust at N + 5000 ft, Mach Number 0.85



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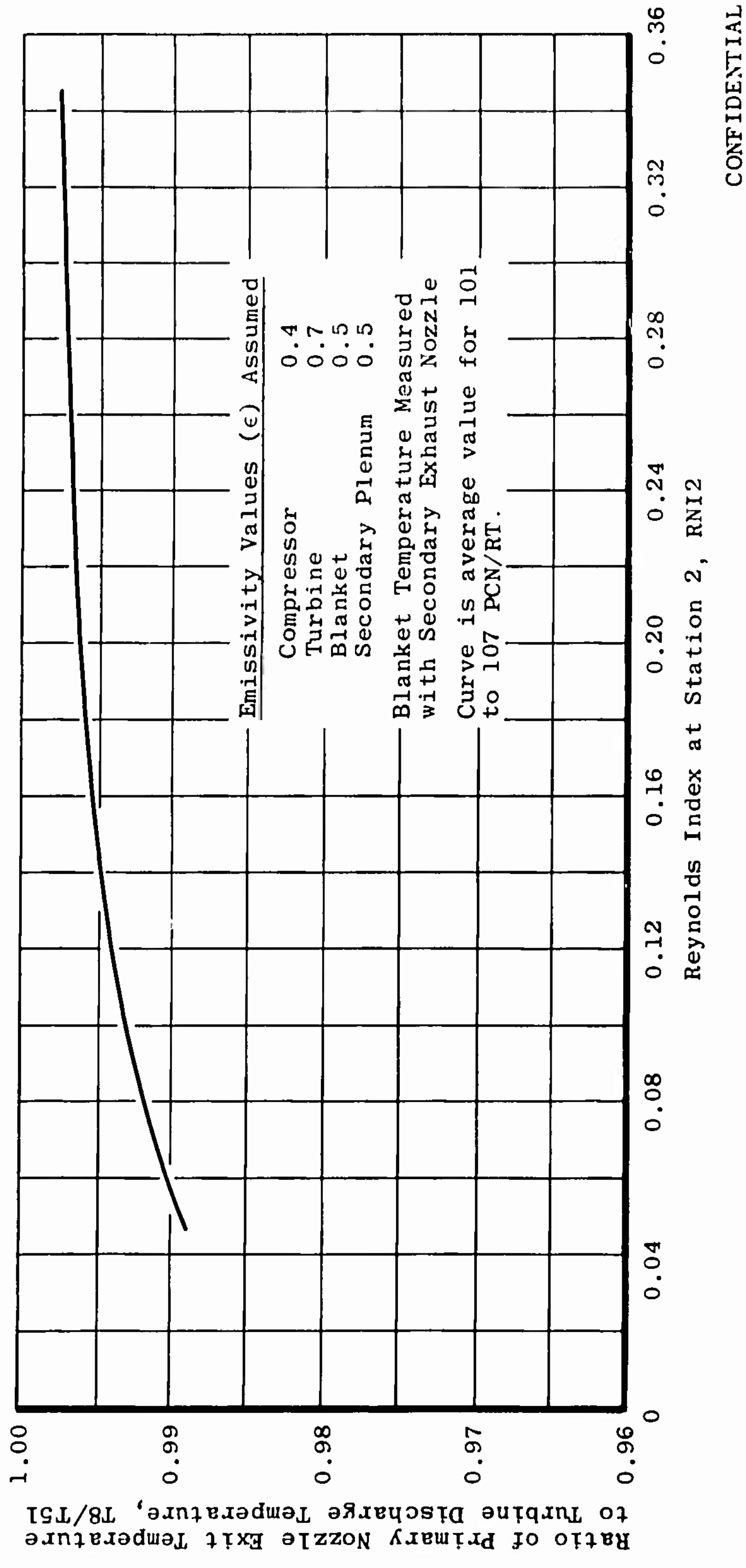
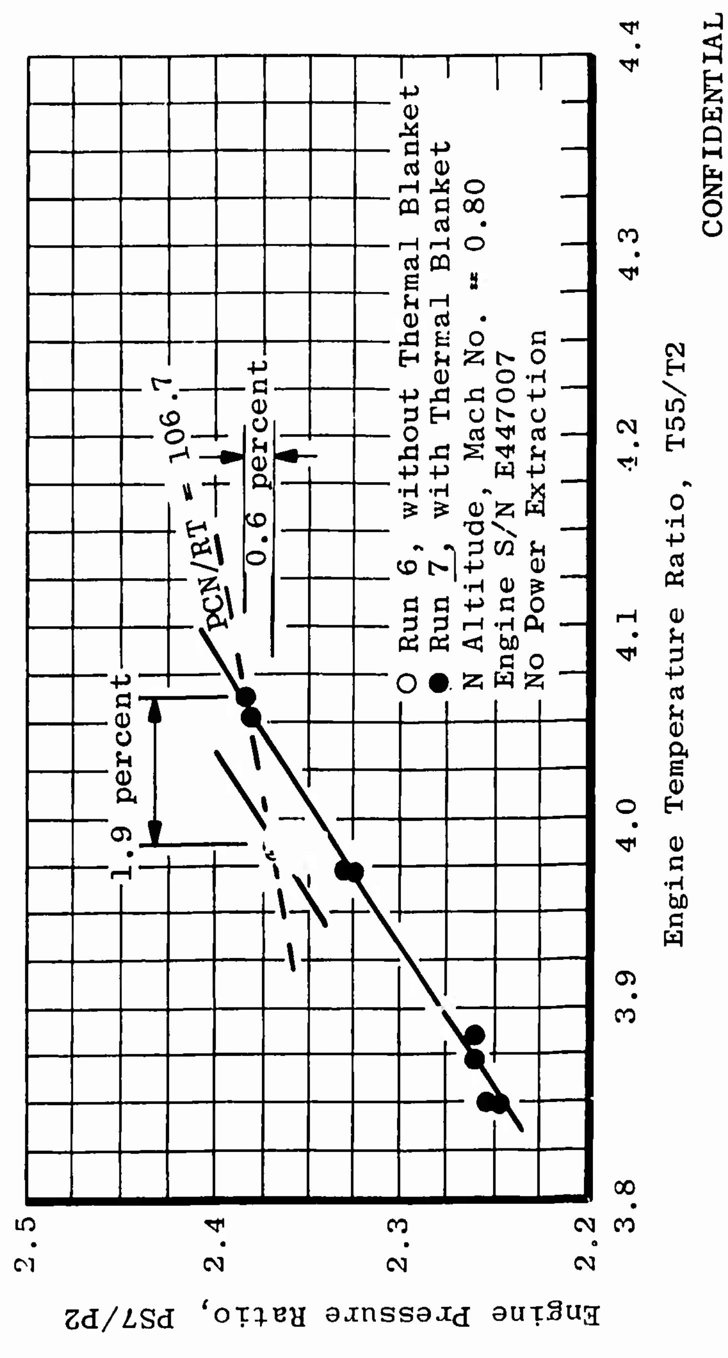
a. Without Tailpipe Blanket

(U) Fig. 12 Ratio of Primary Nozzle Exit Temperature to Turbine Discharge Temperature for J97 Engine



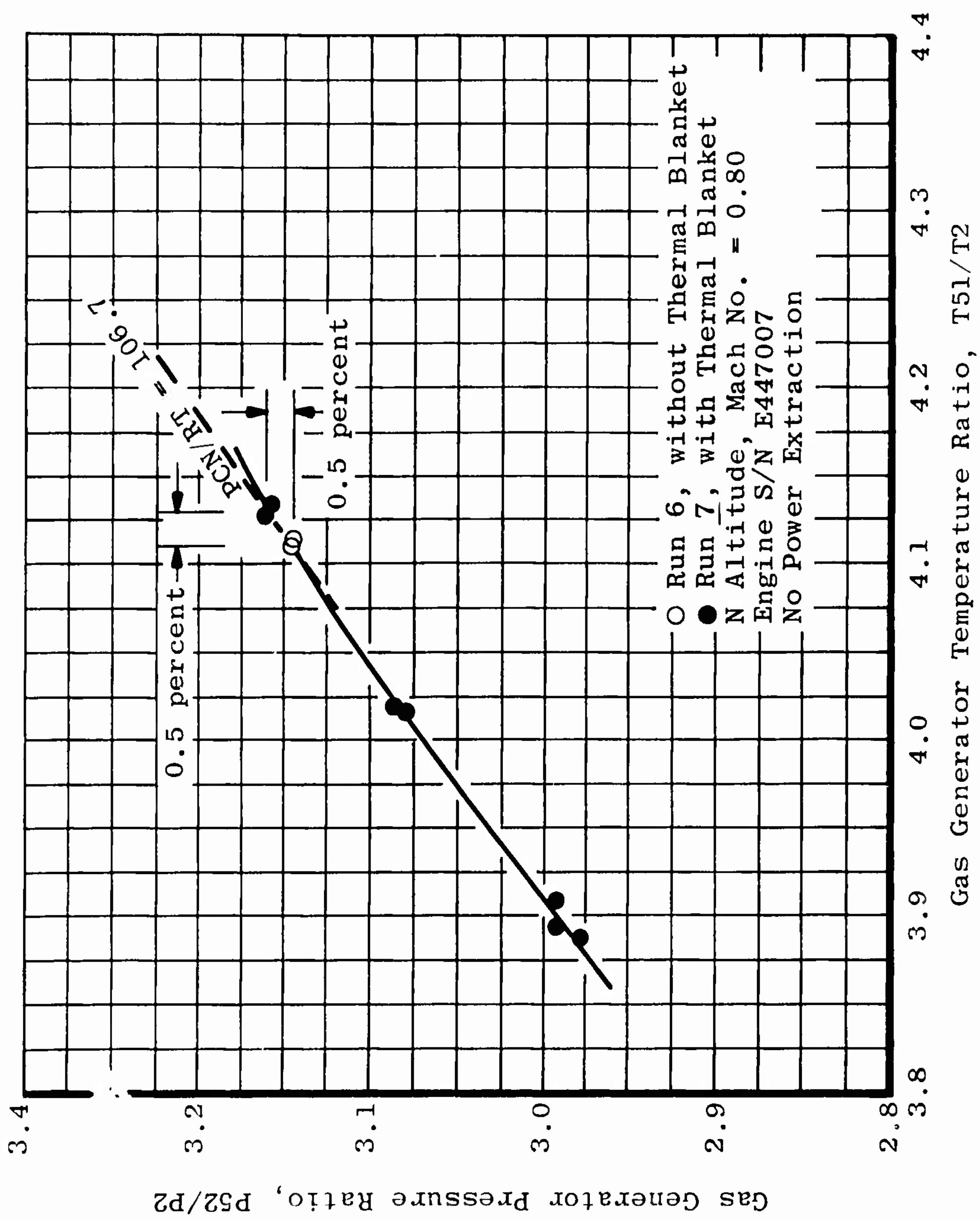
b. With Tailpipe Blanket

Fig. 12 Concluded



a. PS7/P2 versus T55/T2

(U) Fig. 13 Effects of Tailpipe Thermal Blanket on Pumping Characteristics



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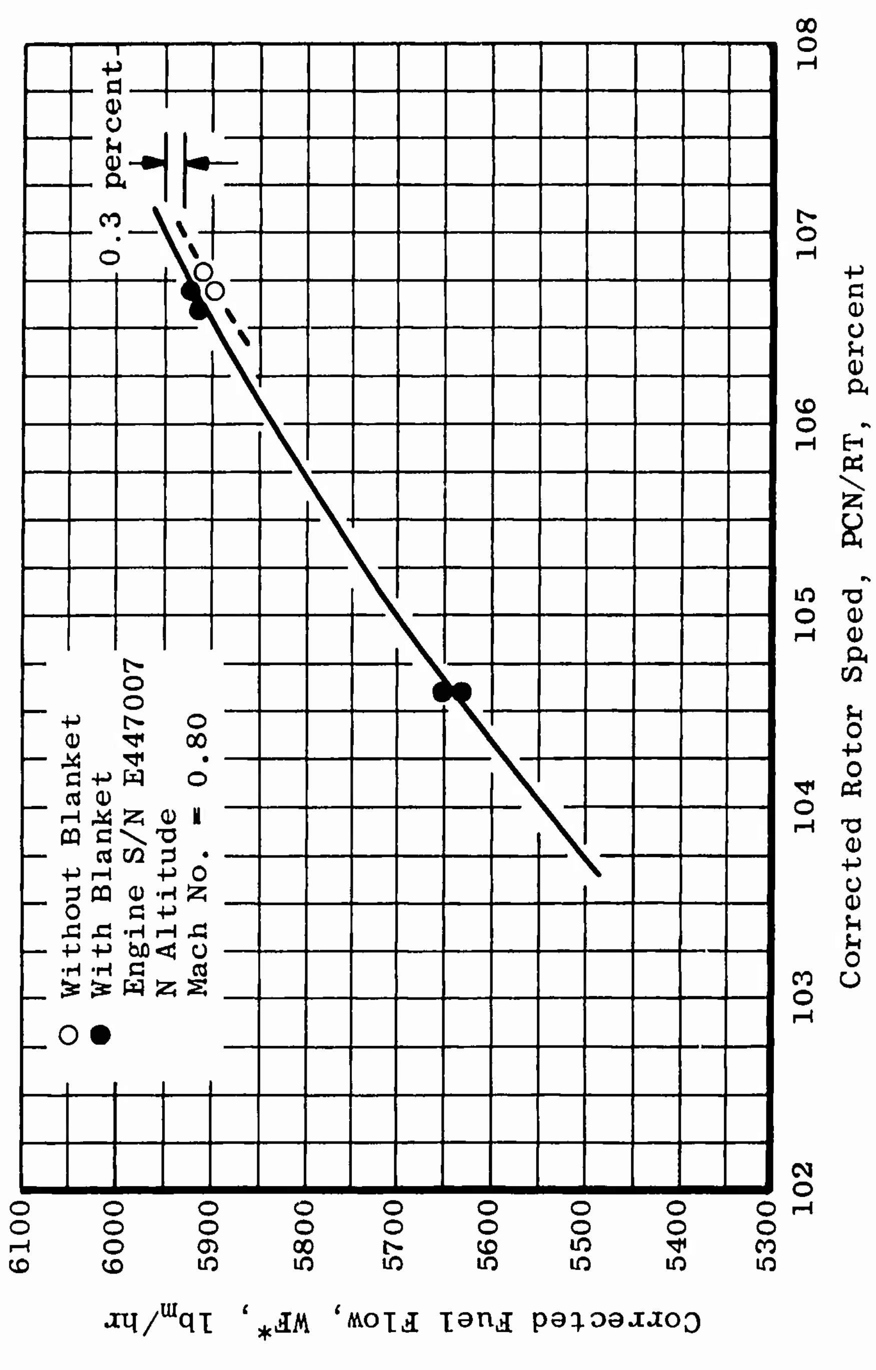
b. P52/P2 versus T51/T2

Fig. 13 Concluded



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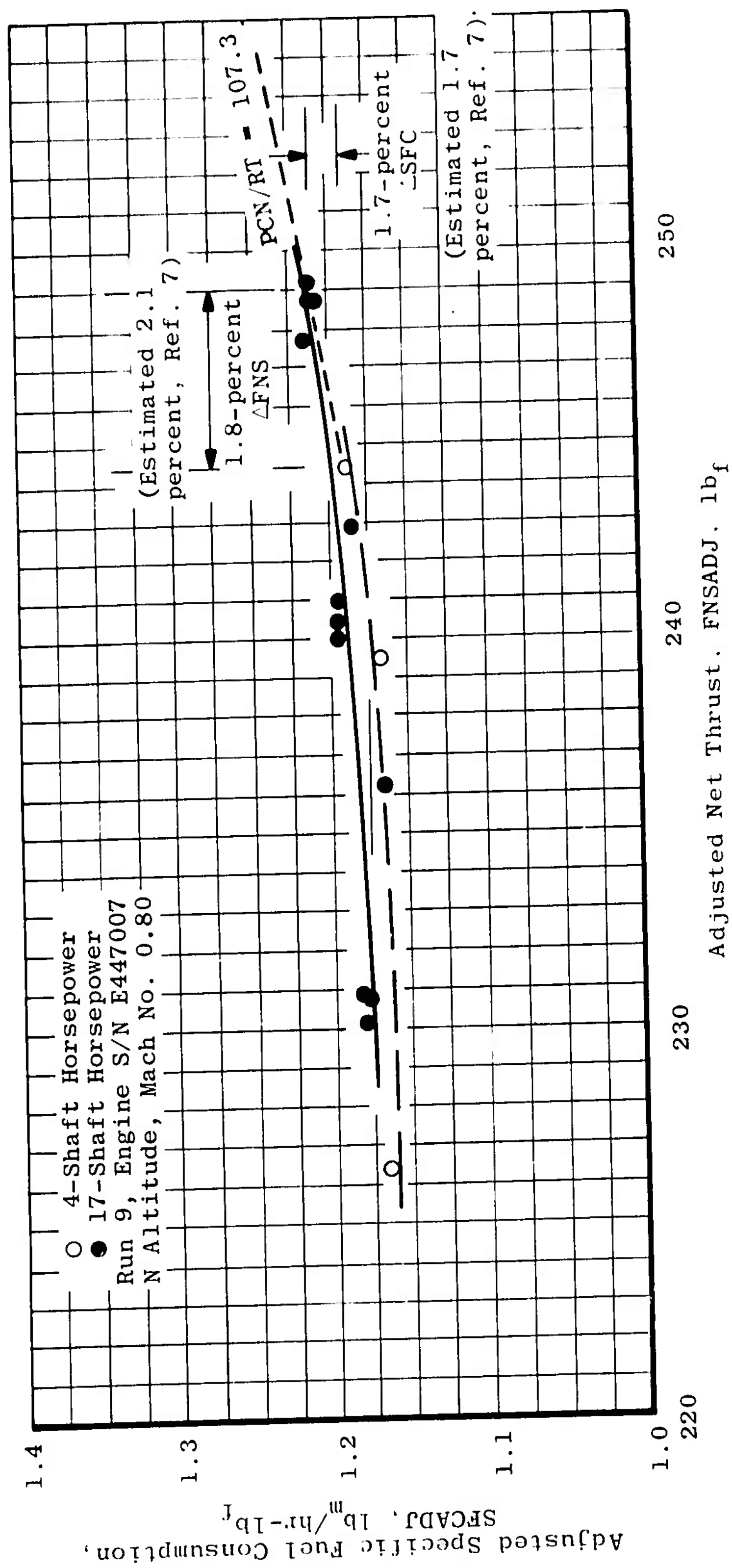
(U) Fig. 14 Effect of Tailpipe Blanket on Engine Fuel Flow



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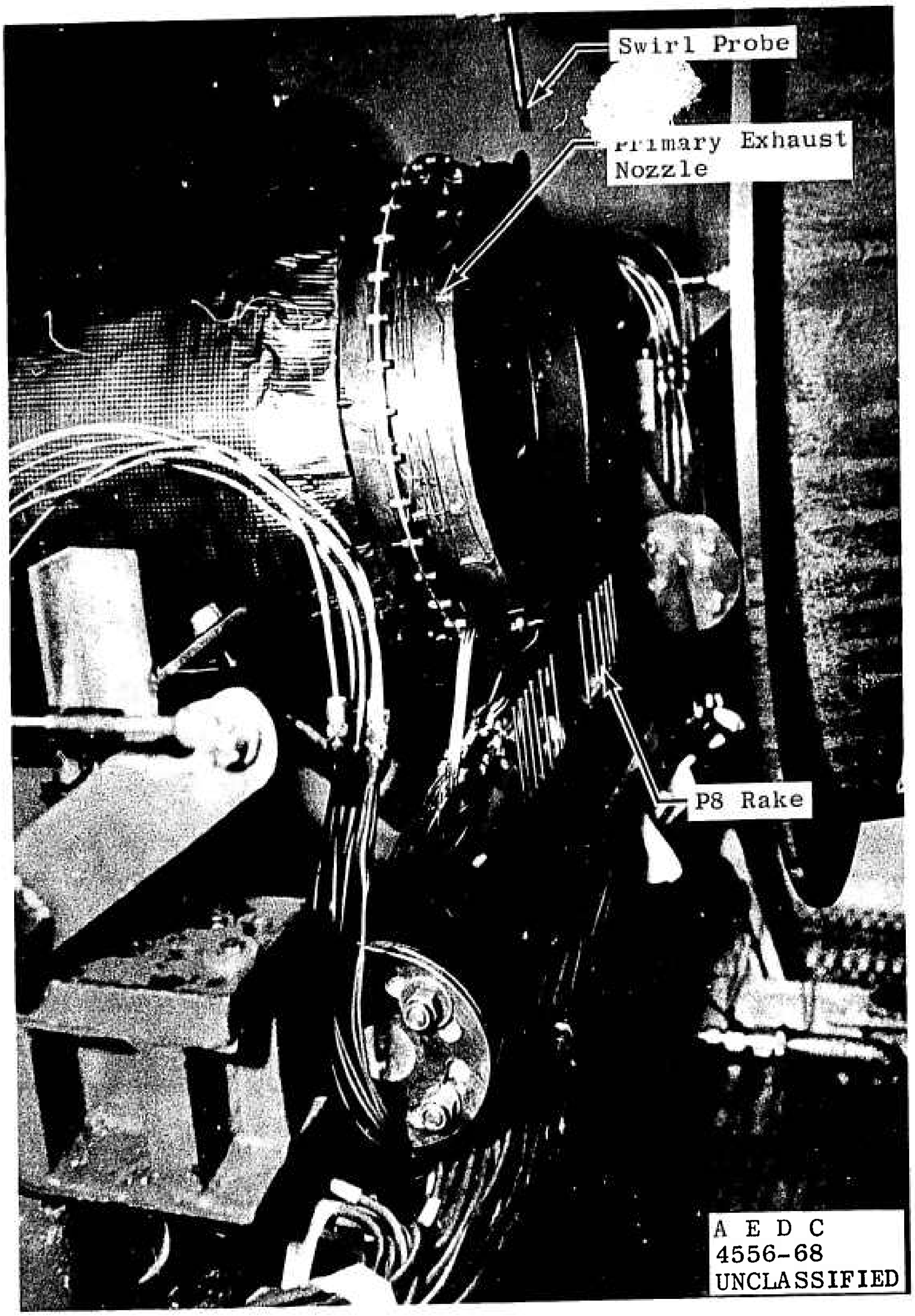
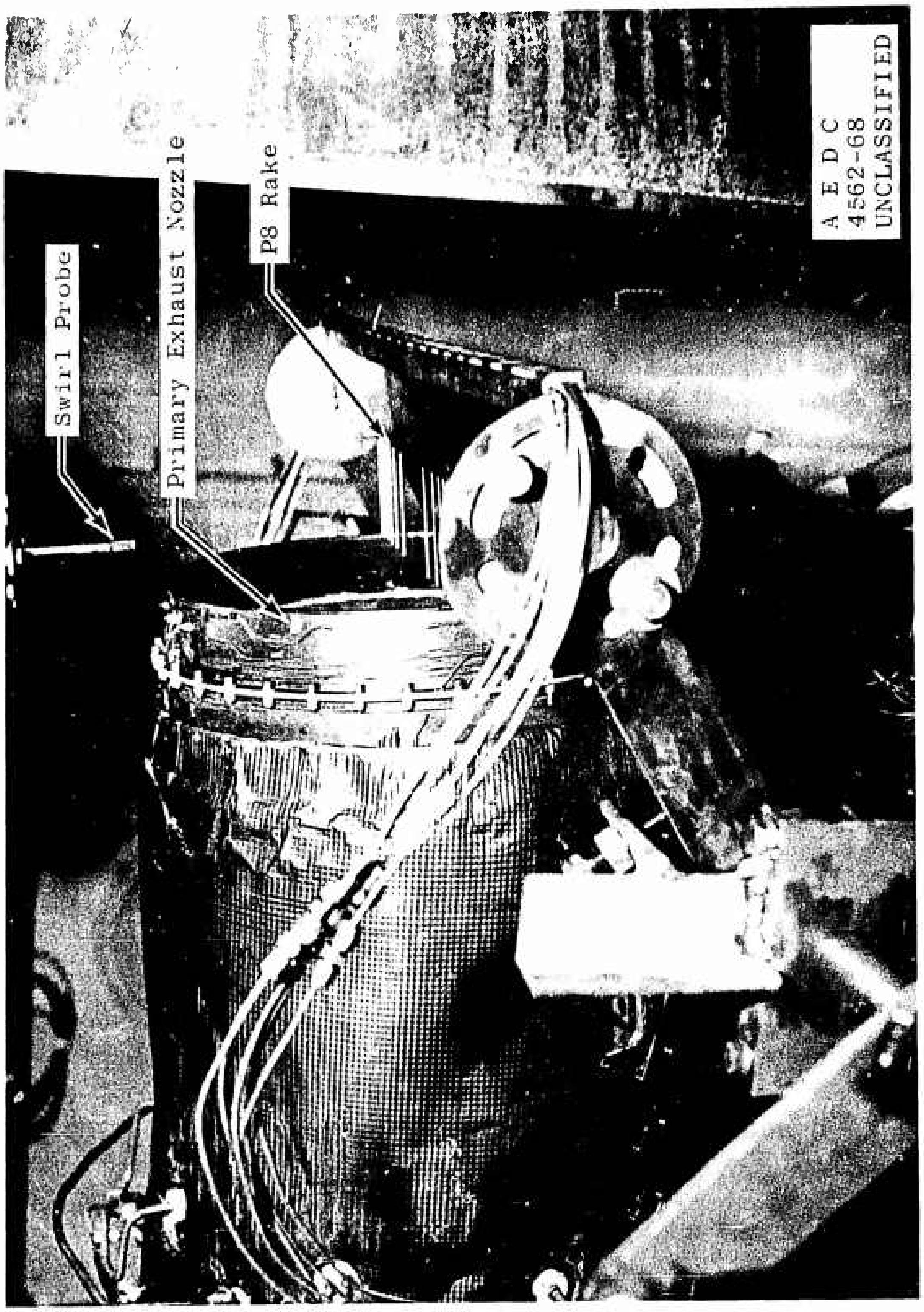
(U) Fig. 15 Effects of Power Extraction on Thrust and Specific Fuel Consumption



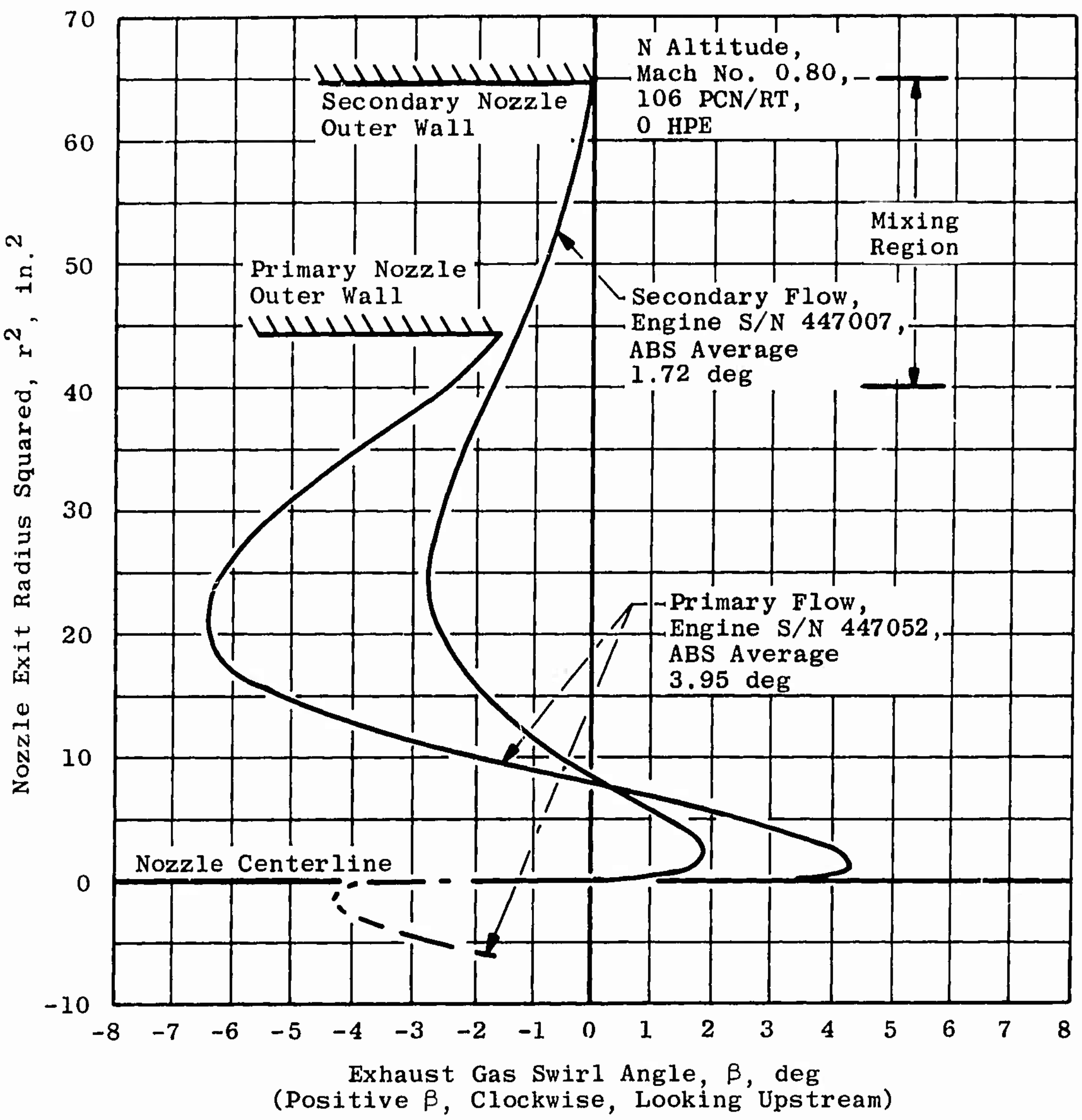
a. Swirl Probe Retracted with P8 Rake Retracted

(U) Fig. 16 Swirl Probe and Station 8 Total Pressure Rake

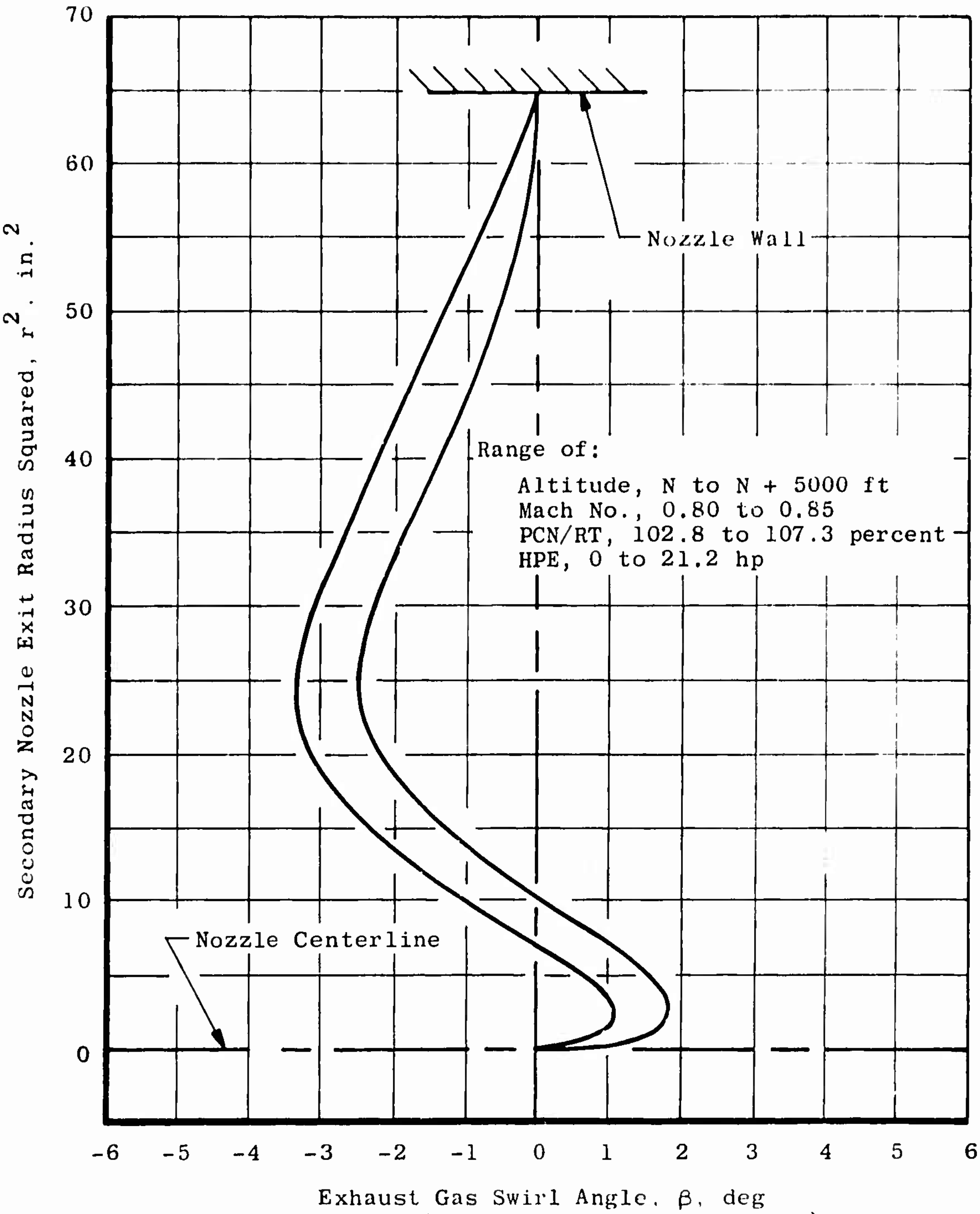


b. Swirl Probe Retracted with P8 Rake Inserted

Fig. 16 Concluded



(U) Fig. 17 Comparison of Primary and Secondary Nozzle Measured Swirl Angles



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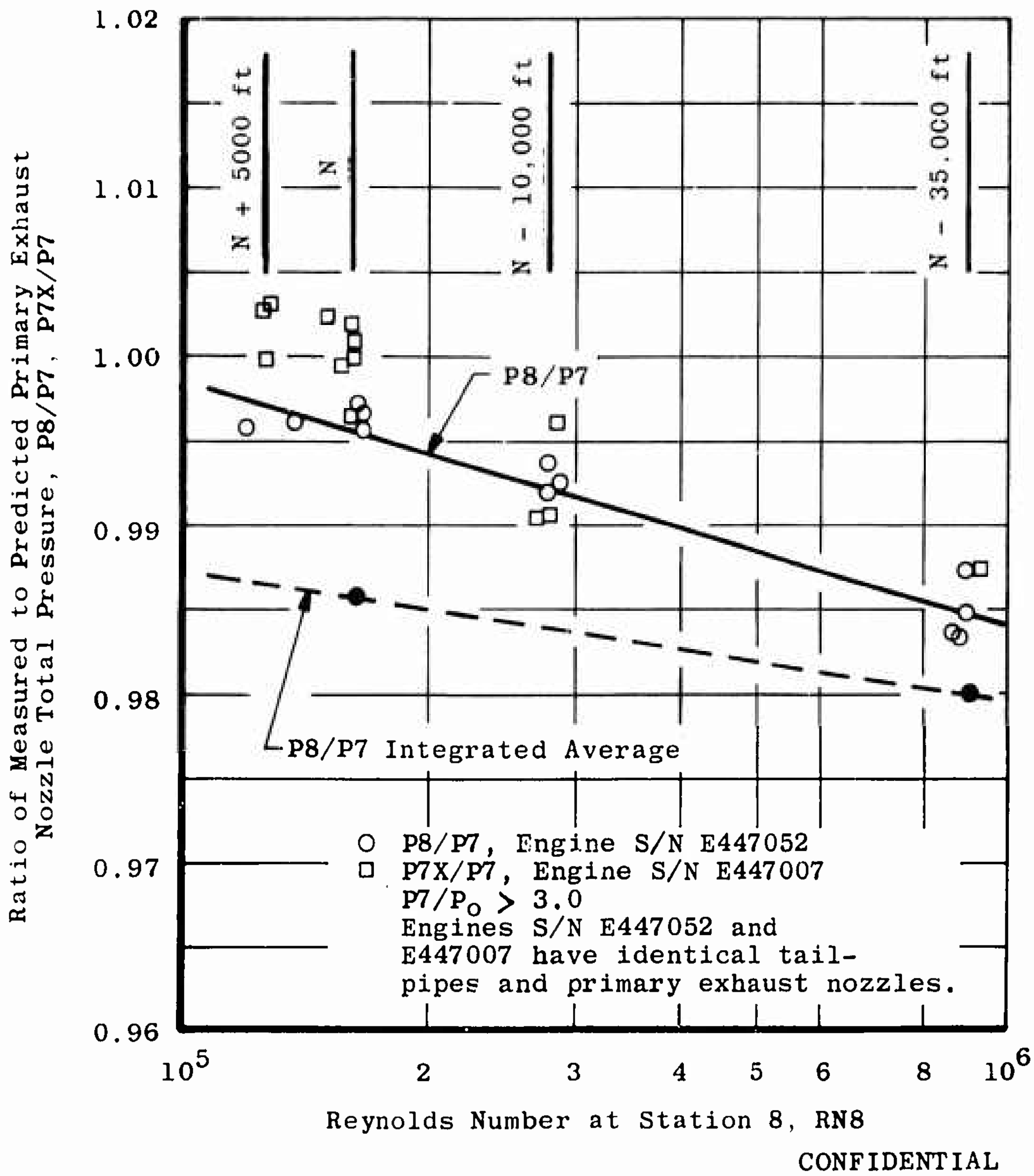
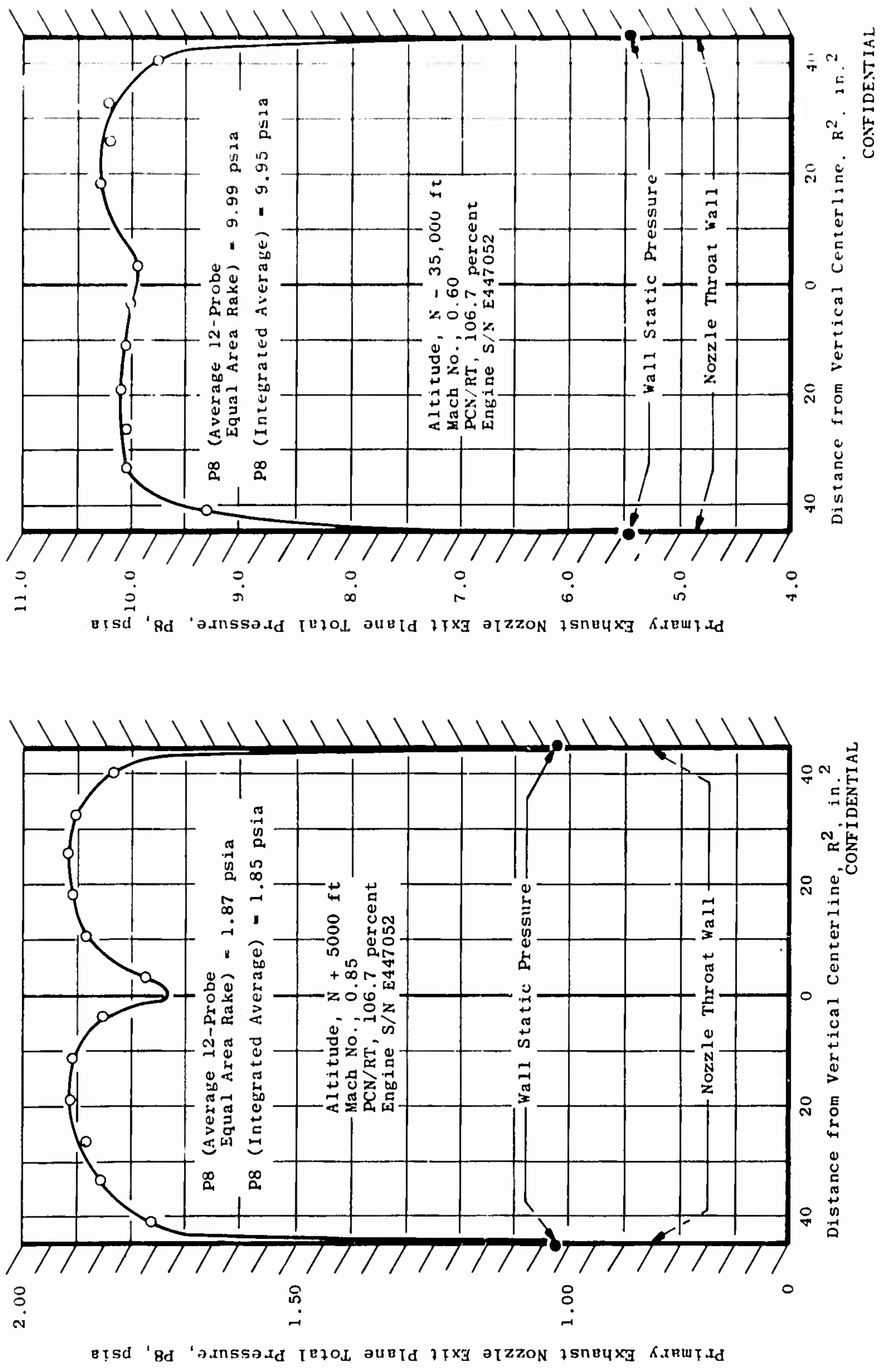
(U) Fig. 18 Secondary Nozzle Exit Swirl Angle Band over a Range of Altitude, Mach Number, Rotor Speed, and Power Extraction Loads



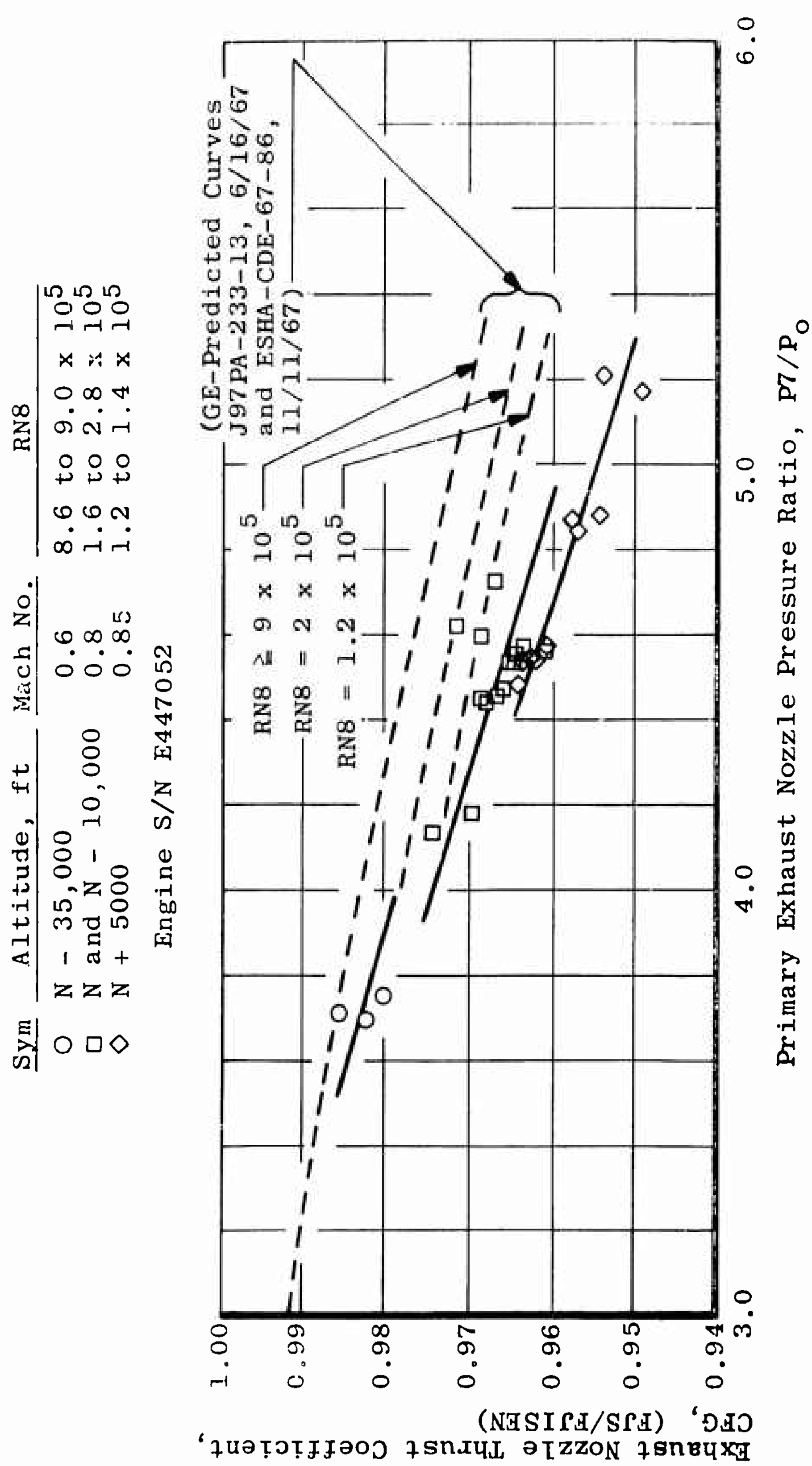
(U) Fig. 19 Comparison of Measured-to-Predicted Primary Exhaust Nozzle Total Pressure



a. N + 5000 ft

b. N - 35,000 ft

(C) Fig. 20 Primary Exhaust Nozzle Total Pressure Profile



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(U) Fig. 21 Primary Exhaust Nozzle Thrust Coefficient

TABLE I
(U) STEADY-STATE MEASUREMENT UNCERTAINTY

Parameter Designation	Estimated Measurement Uncertainty (2 Sigma)			Type of Measuring Device	Type of Recording Device	Method of System Calibration
	Steady State		Range of Measurement			
	Percent of Reading	Units of Measurement				
Venturi Inlet Total Pressure, psia	±0.27		8.0 to 10.0	Bonded Strain-Gage Pressure Transducers	Automatic Multiple Pressure Scanning System into Millivolt-to-Digital Converter, Sequential Sampling, and Magnetic Tape Storage Data Acquisition System	In-Place Pressure
	±0.65		2.0 to 3.5			
Compressor Inlet Static Pressure, psia	±0.31		2.0 to 3.5			
	±1.5		0.5 to 1.0			
Compressor Inlet Total Pressure, psia	±0.31		2.0 to 3.5			
	±1.2		0.7 to 1.0			
Test Cell Plenum Static Pressure, psia	±0.31		2.0 to 3.5			
	±1.62		0.5 to 1.0			
Inlet Duct Static Pressure, psia	±0.31		2.0 to 3.5			
	±1.62		0.5 to 1.0			
Test Cell Static Pressure, psia	±0.31		2.0 to 3.5			
	±1.62		0.4 to 1.0			
Compressor Discharge Static Pressure, psia	±0.50		40 to 50			
	±0.55		10 to 20			
Primary Nozzle Static Pressure, psia	±0.31		2.0 to 3.5			
	±1.62		0.4 to 1.0			
Tailpipe Static Pressure, psia	±0.27		7.5 to 8.0			
	±0.65		2.0 to 3.5			
Turbine Discharge Static Pressure, psia	±0.27		8.0 to 10.0			
	±0.65		2.0 to 3.5			
Exhaust Nozzle Total Pressure, psia	±0.27		9.0 to 10.0			
	±0.65		2.0 to 3.5			
Turbine Discharge Total Temperature		±6.3°F	900 to 1000	Chromel-Alumel Temperature Transducers	Millivolt-to-Digital Converter, Sequential Sampling, and Magnetic Tape Storage Data Acquisition System	[illegible] and [illegible]
		±7.8°F	1100 to 1450			
Tailpipe External Temperature		±4.5°F	300 to 400			
		±4.5°F	450 to 550			
Primary Nozzle Skin Temperature		±6.0°F	800 to 925			

TABLE I (Concluded)

Parameter Designation	Estimated Measurement Uncertainty (2 Sigma)			Type of Measuring Device	Type of Recording Device	Method of System Calibration
	Steady State		Range of Measurement			
	Percent of Reading	Units of Measurement				
Venturi Discharge Total Temperature		±3.3°F	-60 to -40	Copper-Constantan Temperature Transducers	Millivolt-to-Digital Converter, Sequential Sampling, and Magnetic Tape Storage Data Acquisition	Millivolt Source and NBS Temperature Tables
		±3.3°F	-40 to -10			
Oil Cooler Water Inlet Temperature		---	---			
		±3.3°F	80 to 100			
Oil Cooler Water Outlet Temperature		---	---			
		±3.7°F	100 to 300			
Compressor Inlet Total Temperature		±3.3°F	-60 to -30			
		±3.3°F	-30 to +10			
Fuel Temperature		±4.5°F	75 to 85	Iron-Constantan Temperature Transducers		
Engine Inlet Fuel Temperature		±4.5°F	75 to 85			
Scale Force, lb_f	$[(0.34)^2 + (\frac{1.0\times100}{FS})^2]^{1/2}$		900 to 1013	Bonded Strain-Gage Force Transducer		In Place with Calibrated Load Cell*
	$[(0.63)^2 + (\frac{1.0\times100}{FS})^2]^{1/2}$		186 to 333			
Engine Speed		±4 rpm	12,500 to 14,000	Electromechanical Transducer	Frequency-to-Voltage Converter onto Millivolt-to-Digital Converter, Sequential Sampling, and Magnetic Tape Storage Data Acquisition System	Frequency Substitution
Fuel Flow, pph	±0.52		900 to 1000	Volumetric Turbine Flow Transducers		In Place Mass Weighing System*
	±1.23		250 to 375			
Oil Cooler Water Flow Rate		---	---	Catch-Tank and Balance Scales	Manual	---
		0.2 pph	20 to 50			

*See Section 2.4.

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TABLE II

(U) SUMMARY OF OPERATION OF J97 ENGINE S/N E447052 AT AEDC

	Total Time
Operating Time at Altitudes less than N ft	9 hr, 15 min
Operating Time at N Altitude	1 hr, 43 min
Operating Time at N + 5000-ft Altitude (Includes 4 hr at Rated Turbine Inlet Temperature)	8 hr, 20 min
Total Operating Time at AEDC	19 hr, 18 min

Vibration levels observed during testing of Engine S/N E447052 were well below the maximum specified limits. Maximum observed values were as follows:

	Maximum Specified Limit, mil	Maximum Observed Level, mil
Compressor Front Frame	4	0.9
Compressor Rear Frame	6	2.1

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TABLE III
(U) ALTITUDE START SUMMARY

Altitude*, ft, Based on Cell Pressure	Mach No. Based on PT_2/P_{cell}	Compressor Inlet Total Temperature, °F	Windmill, rpm	Number of Starts
30,000	0.65	-5 to +78	3060 to 3560	8
39,000	0.70	-5	3326	1

*The conditions listed are conditions for all start attempts for J97 engine S/N E447052. Successful starts were made on each start attempt.

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TABLE IV
(U) ENGINE FLAMEOUT OR STALL DATA FOR J97 ENGINE S/N E447052

Approximate Altitude at which Flameout Occurred, ft	PCN/RT	Remarks
N - 5000	93	Flameout occurred during plant transient from N - 45,000 ft to N altitude.
N	106	Flameout occurred during inlet pressure fluctuations due to facility problems.
N + 5000	103	Altitude set conditions were steady state. Fuel and compressor discharge pressures started to fluctuate with a resultant increase in T55. Blue flame was observed in exhaust gases. Throttle was chopped.
N + 5000	106	High inlet distortion levels were imposed by airflow from the labyrinth seal pressure balance system. Throttle chop was preceded by fuel and compressor discharge pressure fluctuations and an increase in T55.

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APPENDIX III
METHODS OF CALCULATIONS

(U) The general methods and equations used to compute the parameters presented in this report are given below. Where applicable, the arithmetic average of pressure and indicated temperatures was used.

SPECIFIC HEAT

(U) The specific heat at constant pressure was calculated from the empirical equation,

$$c_p = \frac{(a_1 + b_1 T + c_1 T^2) + F(a_2 + b_2 T + c_2 T^2)}{1 + F}$$

where a_1, b_1, and c_1 are constants based on the specific heats of the constituents of air, and a_2, b_2, and c_2 are constants based on fuel hydrogen-carbon ratio of 0.16 and the specific heats of water vapor, oxygen, and carbon dioxide.

Temperature Range, °R	a_1	b_1	c_1	a_2	b_2	c_2
400 to 1700	0.2318	0.104×10^{-4}	0.7166×10^{-8}	0.2655	3.7265×10^{-4}	-6.6353×10^{-8}
1701 to 4500	0.2214	0.3521×10^{-4}	-0.3776×10^{-8}	0.3397	2.7182×10^{-4}	-2.9044×10^{-8}

(U) The ratio of specific heats was determined from

$$\gamma = \frac{c_p}{c_v} \quad \text{where } c_v = c_p - \frac{R}{J}$$

AIR AND GAS FLOW

Air

(U) Airflow at station 1N (venturi throat) was calculated for a choked venturi from the equation,

$$\mathrm{WA1N} = \frac{P_{00}\,(\mathrm{CF1N})\,\mathrm{A1N}\,(\mathrm{CT1N})\sqrt{\dfrac{\gamma g_c}{R}\left(\dfrac{2}{\gamma + 1}\right)^{\frac{\gamma+1}{\gamma-1}}}}{\sqrt{\mathrm{TT1D}}}$$

where $\gamma = \gamma 2$; CT1N, the area thermal expansion coefficient, was calculated from the venturi wall temperature, and CF1N is an empirically determined flow coefficient based on venturi curvature and boundary-layer development (Ref. 11).

For small venturi,

$$CF1NA = 0.97918 + 2.2010 \times 10^{-3} \log(RN1A)$$

where

$$RN1A = \text{small venturi throat Reynolds number}$$

For large venturi,

$$CF1NB = 0.97773 + 2.6467 \times 10^{-3} \log(RN1B)$$

where

$$RN1B = \text{large venturi throat Reynolds number}$$

$$W2 = WA1NA + WA1NB$$

Turbine Cooling Air

(U) Compressor discharge bleed air (WC) for turbine cooling purposes was determined from the equation,

$$WC = WC3 + WC4 = 0.0700\ W2 + 0.0494\ W2$$

where, for calculation purposes, WC3 was assumed to reenter the primary gas stream at the turbine exit and WC4 at the turbine inlet. The above fractions of the total airflow were supplied by the engine manufacturer.

(U) Airflow at station 31 was determined from the equation,

$$W31 = W2 - WC3 - WC4 = 0.8806\ W2$$

Gas Flow

(U) Gas flow at station 39 was determined from

$$W39 = W31 + WF/3600$$

(U) Gas flow at stations 40 and 50 was obtained from

$$W40 = W50 = W2 - WC3 + WF/3600$$

(U) Gas flow at stations 51 and 8 was calculated from the equation,

$$W51 = W8 = W2 + WF/3600$$

HEAT RATE

(U) The heat rate of the lube oil to water heat exchanger was calculated as follows:

$$QSW = WCW\ (CPWOC)\ (TWSCD - TWSCI)$$

where

WCW = cooling water flow rate
$CPWOC$ = average c_p of cooling water = 1.020
$TWSCD$ = cooling water discharge temperature
$TWSCI$ = cooling water inlet temperature

ENTHALPY

(U) The enthalpy of air was obtained by integrating the equation

$$H = \int_{400^{\circ}R}^{T} c_p\, dt$$

(U) The enthalpy of turbine inlet, turbine discharge, and exhaust gases was calculated as follows:

$$H51 = \frac{H2W2 + \dfrac{WF}{3600}\left[ETABM \times h_L + 59.62 + \displaystyle\int_{540}^{TF} C_{P_{JP-4}}\, dt\right] - \dfrac{QSW}{3600}}{W51}$$

where the burner efficiency (ETABM) is calculated from an empirical equation furnished by the engine manufacturer as follows:

$$ETABM = \eta_{Base} \left(\frac{P3}{15}\right)^{0.084} \left(\frac{T3}{1160}\right)^{0.25} \quad \text{(limited to 0.985)}$$

where

η_{Base} = base burner efficiency (Fig. III-1)

and where the quantity +59.62 Btu/lb_m of fuel is the difference between the enthalpy of exhaust gas at 540°R and air at 400°R per pound of fuel burned. The term QSW is the equivalent heat removed by the lube oil auxiliary cooler and is determined from lube system heat rejection data.

$$H50 = \frac{W51\ (H51) - (WC3)\ H3}{W50}$$

$$H40 = H50 + \frac{W2\ (H3 - H2)}{W4}$$

where turbine energy extraction is assumed equal to the energy added by the compressor.

$$H39 = \frac{W40\ H40 - WC4\ H3}{W39}$$

TEMPERATURE

Measured

(U) Total temperature for station 1D was obtained by dividing the indicated temperature by a correction factor of 0.9977 per NACA TN 3766 (Ref. 12).

(U) Total temperature for station 2 was obtained by applying a recovery factor to the indicated temperature through the equation,

$$T = \frac{T_i}{\left(\frac{PS}{P}\right)^{\frac{\gamma-1}{\gamma}} + RF\left[1 - \left(\frac{PS}{P}\right)^{\frac{\gamma-1}{\gamma}}\right]}$$

where

$$RF = 0.9327 \text{ (station 2)}$$

(C) The station 2 temperature was also corrected for pressure per NACA TN 3766 (Ref. 12). The pressure correction for a similar, self-aspirating thermocouple (configuration 6, Ref. 12) was obtained from Fig. 7 of Ref. 12. The curve had to be extrapolated from 0.17 atm (2.5 psia) down to approximately 0.05 atm (0.75 psia) to obtain corrections for the full range of test conditions (Fig. III-2). At 0.05 atm, the extrapolated value of the correction ratio was 3.4 times the value at 1 atm. No adjustments were made for any differences in probe geometry between the actual probe and configuration 6 in Ref. 12.

Calculated

(U) The calculated total temperature at stations 39, 40, 50, and 51 was obtained from the iteration of the equation,

$$\int_{400^\circ R}^{T} c_p\, dt = H$$

where H is the calculated enthalpy.

(U) The total temperature at the compressor discharge (T3) was not measured but was obtained from the compressor inlet total temperature and pressure, the compressor discharge total pressure, and the predicted compressor efficiency obtained from the test of engine S/N E447051 (Ref. 5) as follows:

$$\mathrm{PR2} = 2.7183^{(3.3822\,\ln \mathrm{T2} + 1.5175 \cdot 10^{-4}\,\mathrm{T2} + 5.2294 \cdot 10^{-8}\,\mathrm{T2}^2 - 20.332)}$$

(equation of air tables)

$$\mathrm{PR3I} = \mathrm{PR2}\left(\frac{\mathrm{P3}}{\mathrm{P2}}\right)$$

T3I determined by iterating equation for PR2 substituting T3I in place of T2 and PR3I in place of PR2

$$\mathrm{H3I} = \int_{400}^{\mathrm{T3I}} c_p\, d\mathrm{T}$$

$$\mathrm{H2} = \int_{400}^{\mathrm{T2}} c_p\, d\mathrm{T}$$

$$\mathrm{H3} = \left(\frac{\mathrm{H3I} - \mathrm{H2}}{\mathrm{ETAC}}\right) + \mathrm{H2}$$

ETAC determined from Fig. III-3, T3 determined by iterating

$$\mathrm{H3} = \int_{400}^{\mathrm{T3}} c_p\, d\mathrm{T}$$

(U) The total temperature at the primary exhaust nozzle exit (T8) was determined from the calculated turbine exit temperature (T51) and a theoretical calculation of the thermal losses in the tailpipe between stations 51 and 8 as follows:

$$\mathrm{T8} = \frac{\mathrm{T8}}{\mathrm{T51}} \times \mathrm{T51}$$

where T8/T51 was obtained from Fig. III-4.

(U) To calculate the external heat losses of the engine through the external skin (Fig. III-4), the following assumptions were made:

(U) 1. The model for net radiation heat transfer between the engine and cell wall was assumed to be a series of concentric cylinders.

(U) 2. Estimates were made of all skin temperatures where skin thermocouple measurements were not available.

(U) Net radiation heat transfer from the engine was calculated as follows:

$$Q_{rad} = \frac{A_{eng} \times \sigma \times (T_{eng}{}^4 - T_{cell}{}^4)}{\frac{1}{\epsilon_{eng}} + \frac{A_{eng}}{A_{cell}} \left(\frac{1}{\epsilon_{cell}} - 1 \right)}, \text{ Btu/hr}$$

where

σ = Boltzmann radiation constant = 0.1711×10^{-8} Btu/hr-ft^2-°R

(U) For simplification purposes and because the major portion of the heat losses occurs in the tailpipe and primary nozzle, it was assumed that all of the heat losses occurred between the turbine exit (T51) and the primary nozzle exit (T8). Based on these assumptions, the effect of the heat losses on the gas temperature at station 8 was calculated by

$$T8 = T51 - \frac{Q_{rad}}{c_p \, W8 \times 3600}$$

A curve of T8/T51 is enclosed for the engine (Fig. III-4). The assumptions made in the calculation of the T8/T51 curve are shown on the curve.

PRESSURE (CALCULATED)

Compressor Discharge Total Pressure

(U) The total pressure (P3) at the compressor discharge (station 3) was determined from the measured compressor discharge static pressure and the relationship of PS3 and P3, determined during the test of J97 engine S/N E447051 (Fig. III-5).

Primary Exhaust Nozzle Total Pressure

(U) The exhaust nozzle inlet total pressure (P7), used in all calculations, was not measured but was determined from P52 and empirical information obtained from Ref. 4 (Fig. III-6).

(U) Another exhaust nozzle total pressure was calculated, for comparison only, as follows:

$$P7X = \frac{PS7}{\left(\frac{PS7}{P7}\right)}$$

where PS7 is measured static pressure in the tailpipe and (PS7/P7) is determined from iteration of:

$$\frac{W8\sqrt{T55}}{PS7 \times A7 \times CF7} = \frac{\sqrt{\frac{2\gamma g}{R(\gamma-1)}\left[1-\left(\frac{PS7}{P7}\right)^{\frac{\gamma-1}{\gamma}}\right]}}{\left(\frac{PS7}{P7}\right)^{\frac{\gamma-1}{\gamma}}}$$

where $\gamma = \gamma 51$ and CF7 is an empirically determined function of RN8 (Fig. III-7).

EXHAUST NOZZLE DISCHARGE COEFFICIENT

(U) A primary exhaust nozzle discharge coefficient was calculated using the following equation,

$$CF8 = \frac{AE8}{A8H}$$

where

$$AE8 = \frac{W8\sqrt{T8}\sqrt{\frac{R}{\gamma g_c}\left(\frac{2}{\gamma+1}\right)}}{PS8}, \text{ for a choked nozzle}$$

and

$$PS8 = P7\left(\frac{2}{\gamma+1}\right)^{\frac{\gamma}{\gamma-1}}$$

where

$$\gamma = \gamma 51$$

REYNOLDS NUMBER INDEX

(U) Reynolds number index was defined as

$$RNI2 = \frac{\delta\,(T2 + 199.5)}{718.2\,(\theta)^2}$$

THRUST

Scale Force Jet Thrust

(U) Jet thrust along the exit nozzle axial centerline was calculated from the expression,

$$FJS = \frac{FS + \frac{W2}{g_c}\,V1 + A1OD\left(PS1 - P_o\right)}{\cos 7\ \deg}$$

where

FS — Load cell force, lbf

A10D — Outside area of primary duct at labyrinth seal

Isentropic Jet Thrust

(U) The isentropic jet thrust was calculated from the equation,

$$FJISEN = W8\,(KV9)\sqrt{\frac{R(T8)}{g_c}}$$

where KV9, the velocity parameter for a perfectly expanded convergent-divergent nozzle, was calculated as follows:

$$KV9 = \sqrt{\frac{2\gamma}{\gamma - 1}\left[1 - \left(\frac{P_o}{P8}\right)^{\frac{\gamma-1}{\gamma}}\right]}$$

where

$$\gamma = \gamma 51$$

Momentum Balance Jet Thrust

(U) The momentum balance jet thrust (FJMB) was calculated by the following equation:

$$FJMMB = \frac{W8}{g_c} V8 + PS8\,(A8H) - P_o\,(A8H) - \Delta FJMMB$$

where

$$V8 = M8\,(CV8)\sqrt{\gamma g_c R(T8)\left(\frac{PS8}{P8}\right)^{\frac{\gamma-1}{\gamma}}}$$

where

$$M8 = 1.0$$

where CV8 is a velocity coefficient obtained from Fig. III-8.

$\gamma = \gamma 51$

$T8$ = calculated primary exhaust nozzle total temperature

$\Delta FJMB = (ACFG + ACFGSW)\,(FJISEN)$

$(ACFG)$ = correction to the velocity coefficient CV8 for a Reynolds number effect (Fig. III-9)

$(ACFGSW)$ = correction to the momentum balance thrust for exhaust gas swirl determined from test measurements = 0.0017 (see Section 4.7)

Thrust Coefficient

(U) Thrust coefficient was calculated by the following equation:

$$CFG = \frac{FJS}{FJISEN}$$

(U) A vacuum thrust coefficient was calculated as follows:

$$CFJSV = \frac{FJS + P_a \, (A8H)}{P7 \, (A8H)}$$

CORRECTED PARAMETERS

(U) Performance parameters were corrected by the following equations:

$$W2^* = \frac{W2\sqrt{\theta}}{\delta}$$

where

$$\theta = T2/518.7°R$$

$$\delta = P2/14.696 \text{ psia}$$

Corrected Rotor Speed

$$N^* = N/\sqrt{\theta}$$

Corrected Fuel Flow

$$WF^* = \frac{WF}{\delta\sqrt{\theta}}$$

Corrected Turbine Discharge Temperature

$$T51^* = \frac{T51}{\theta}$$

ADJUSTED THRUST

(U) A jet thrust (FJSADJ) was computed, which was adjusted to the desired test conditions:

$$FJSADJ = \frac{FJS}{DEL2ADJ} \left(\frac{KV9ADJ}{KV9}\right)$$

where

DEL2ADJ = P2/P2ADJ

P2ADJ = P2 at the desired test condition

KV9ADJ = exhaust nozzle velocity parameter evaluated with as-tested nozzle inlet conditions and an engine exhaust pressure equal to the ambient pressure at the desired test condition altitude

ADJUSTED RAM DRAG

(U) An adjusted ram drag (FDADJ) was computed, which was adjusted to the desired test conditions as follows:

$$FDADJ = \frac{(W2)}{g_c \times DEL2ADJ} \times VOADJ$$

where

$$VOADJ = 109.6 \sqrt{T2ADJ - TOADJ}$$

and where T2ADJ and TOADJ are, respectively, T2 and TO at the desired test condition.

ADJUSTED NET THRUST

(U) Adjusted net thrust (FNSADJ) was calculated as follows:

$$FNSADJ = FJSADJ - FDADJ$$

ADJUSTED SPECIFIC FUEL CONSUMPTION

(U) An adjusted specific fuel consumption (SFCADJ) was calculated as follows:

$$SFCADJ = \frac{WFADJ}{FNSADJ}$$

where

$$WFADJ = \frac{WF}{DEL2ADJ \sqrt{T2/T2ADJ}}$$

ALTITUDE AND MACH NUMBER

(U) Altitude and Mach number were calculated using an iterative process as described below:

1. By using measured cell pressure (P_O) for the first approximation, the altitude and static temperature (T_O) corresponding to this ambient pressure were calculated.
2. For a temperature ratio of $T2/T_O$, the flight Mach number was calculated.
3. For the above-calculated Mach number, the corresponding total-to-static pressure ratio ($P2/P_{OX}$) was calculated.
4. From the ($P2/P_{OX}$), P_O, and a ram pressure recovery (RAM), it was possible to calculate $P2'$.
5. When comparing $P2'$ with the measured value of P2, if they did not agree within 0.0002, a new value was assumed for P_O and entered into step 1 until $|P2' - P2| \leq 0.0002$.

(U) The equations used in this process are as follows:

For $P_{OX} \geq 14.696$ psia,

$$T_o = 518.67\,^\circ R$$
$$\text{Altitude} = 0 \text{ ft}$$

For $3.2826 \leq P_{OX} \leq 14.696$ psia,

$$T_o = \left[518.67\left(\frac{14.696}{P_{oX}}\right)^{-0.19026}\right]_{^\circ R}$$

$$\text{Altitude} = \left[\frac{(T_o - 518.67)}{-0.0035662}\right]_{ft}$$

For $0.79406 \leq P_{OX} \leq 3.2826$ psia,

$$T_o = 389.97^\circ R$$

$$\text{Altitude} = \left[36{,}089 - \frac{\log_e\left(\frac{P_{oX}}{3.2826}\right)}{4.8064 \times 10^{-5}}\right]_{ft}$$

For $0.12589 \leq P_{OX} \leq 0.79406$ psia,

$$T_o = \left[389.97\left(\frac{0.79406}{P_{oX}}\right)^{0.029271}\right]_{^\circ R}$$

$$\text{Altitude} = \left[\frac{T_o - 389.97}{5.4864 \times 10^{-4}} + 65{,}617\right]_{ft}$$

For 1.6086×10^{-2} P_{oX} 0.12589 psia,

$$T_o = \left[411.57\left(\frac{0.12589}{P_{o_X}}\right)^{0.089196}\right]_{^\circ R}$$

$$\text{Altitude} = \left[\frac{T_o - 411.57}{1.5362 \times 10^{-3}} + 104{,}987\right]_{ft}$$

For P_{oX} 1.6086×10^{-2} psia,

$$T_o = 487.17^\circ R$$

$$\text{Altitude} = 154{,}200 \text{ ft}$$

then

$$MO = \sqrt{\frac{2}{\gamma - 1}\left(\frac{T_2}{T_o} - 1\right)}$$

and

$$\left(\frac{P_2}{P_o}\right)_X = \left(1 + \frac{\gamma - 1}{2} MO^2\right)^{\frac{\gamma}{\gamma - 1}}$$

hence

$$P2' = \left(\frac{P_2}{P_o}\right)_X \times P_{oX} \times NR$$

where

$$NR = 0.99$$

PRIMARY GAS STREAM SWIRL ANGLE

Primary Nozzle Only Installed (Engine S/N E447052)

(U) The measured swirl angle ($\beta 8$) was plotted as a function of radius squared (as in Fig. 17), and the absolute average was obtained with a planimeter.

Secondary Nozzle Installed (Engine S/N E447087)

(U) Assumptions used in calculations:

1. The angular momentum at station 8 was equal to the angular momentum at station 9.
2. Isentropic expansion of an ideal gas with the ratio of specific heats (γ) equal to 1.33 between stations 8 and 9.

3. Exhaust swirl angle in the mixing region of the primary and secondary streams is constant and equal to the swirl angle measured at the beginning of the mixing region. This assumption is made to eliminate the effects of the secondary stream on the primary stream.

(U) The swirl angle ($\beta 9$) was measured at station 9, plotted against radius squared (using assumption 3 in the mixing region), and the absolute average ($\beta 9$) was determined with a planimeter.

(U) From Fig. III-10 and assumptions 1 through 3:

V9 was determined for V8 and assumption 2, and

$\beta 8$ was computed using V8, V9, $\beta 9$, and assumption 1

Swirl Correction to Thrust

$$VX8 = V8 (\cos \beta 8) \text{ (see Fig. III-10)}$$

Therefore, the percentage correction to primary exhaust velocity (VX8) for swirl is (1 - cos $\beta 8$) x 100, and the percentage effective correction to total engine gross thrust is approximately:

$$0.7 (1 - \cos \beta) \times 100$$

because the MV term constitutes approximately 70 percent of engine gross thrust.

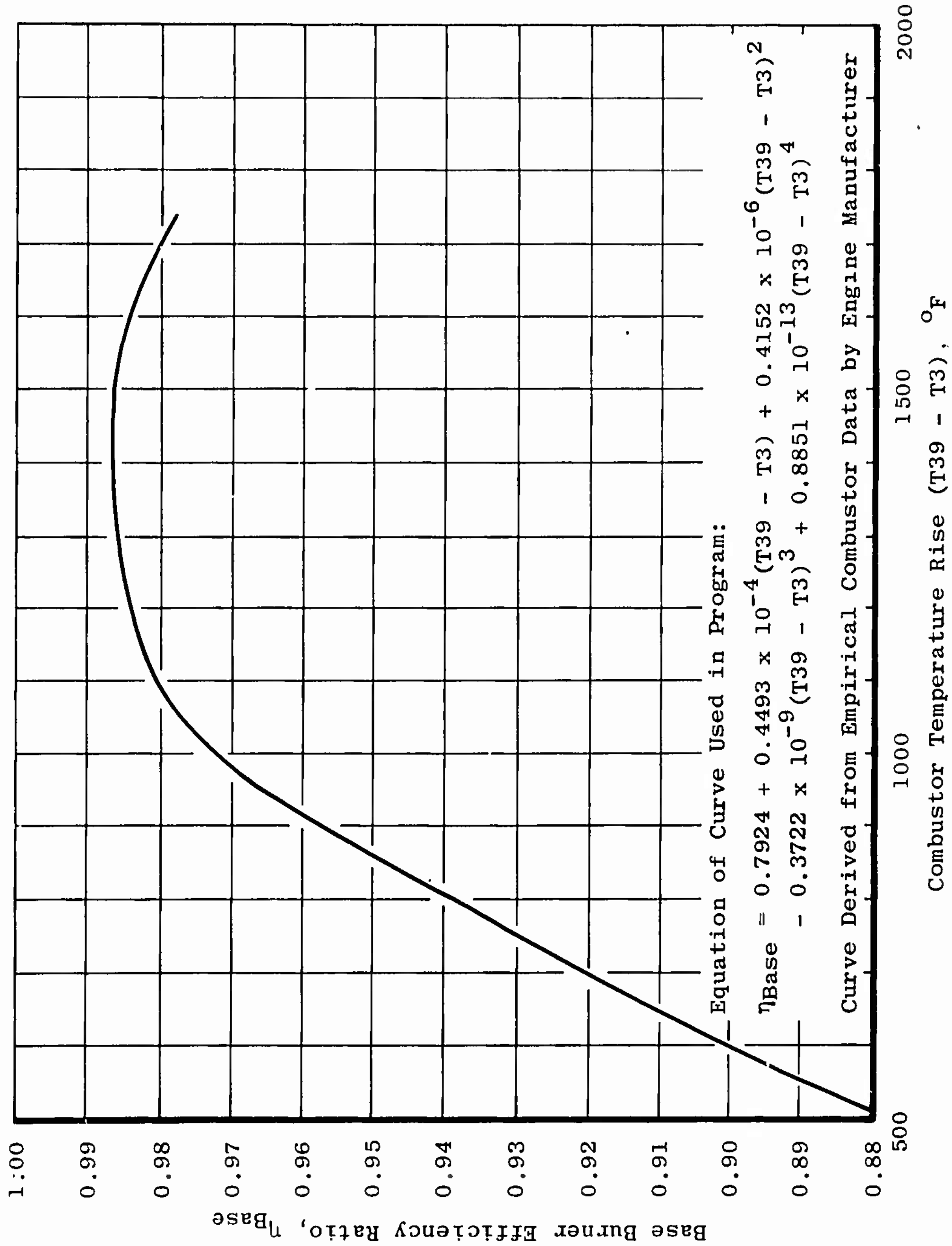

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Fig. III-1 Base Burner Efficiency Ratio

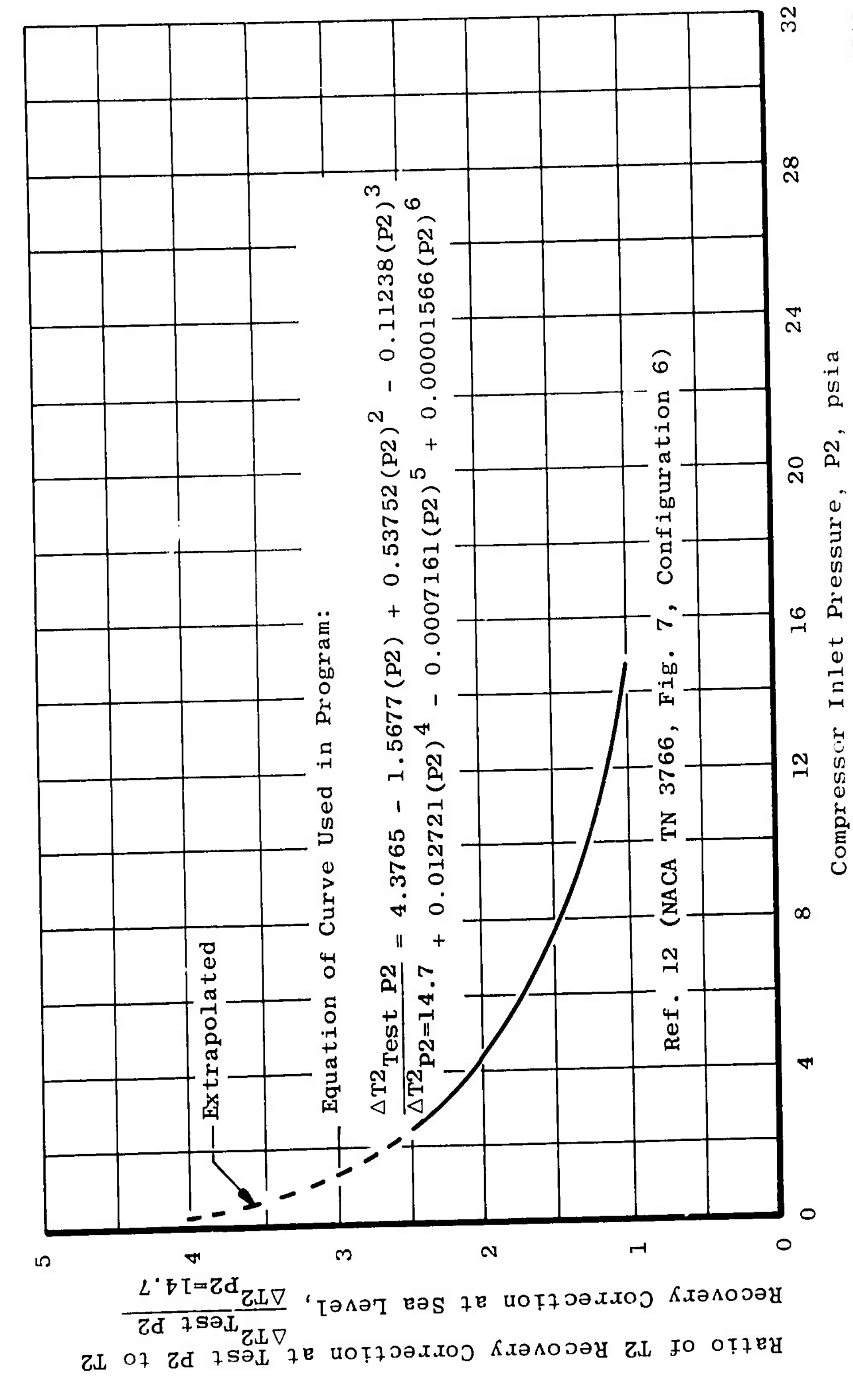

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Fig. III-2 Pressure Effect on T2 Rake Recovery Correction

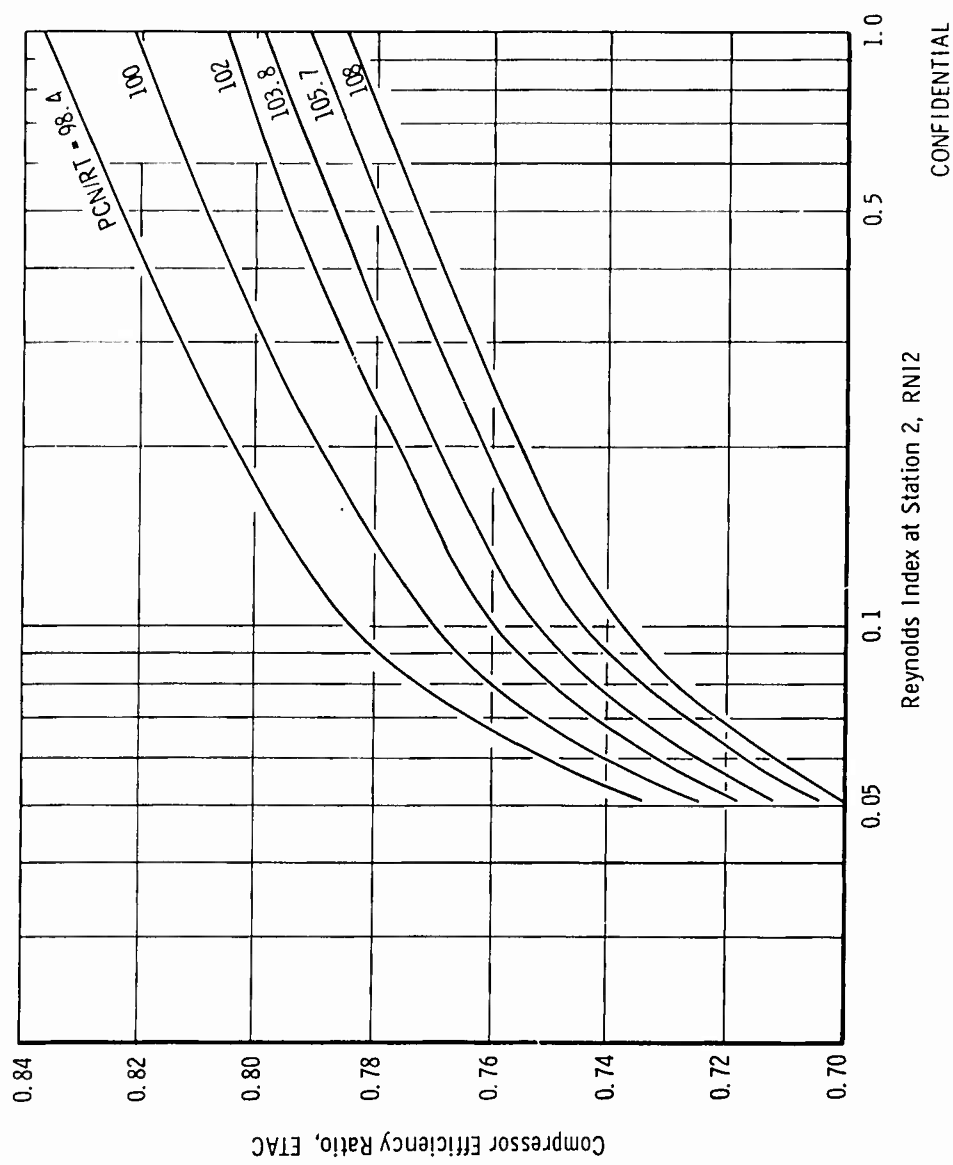

Fig. III-3 Compressor Efficiency as a Function of Reynolds Index at Sta. 2

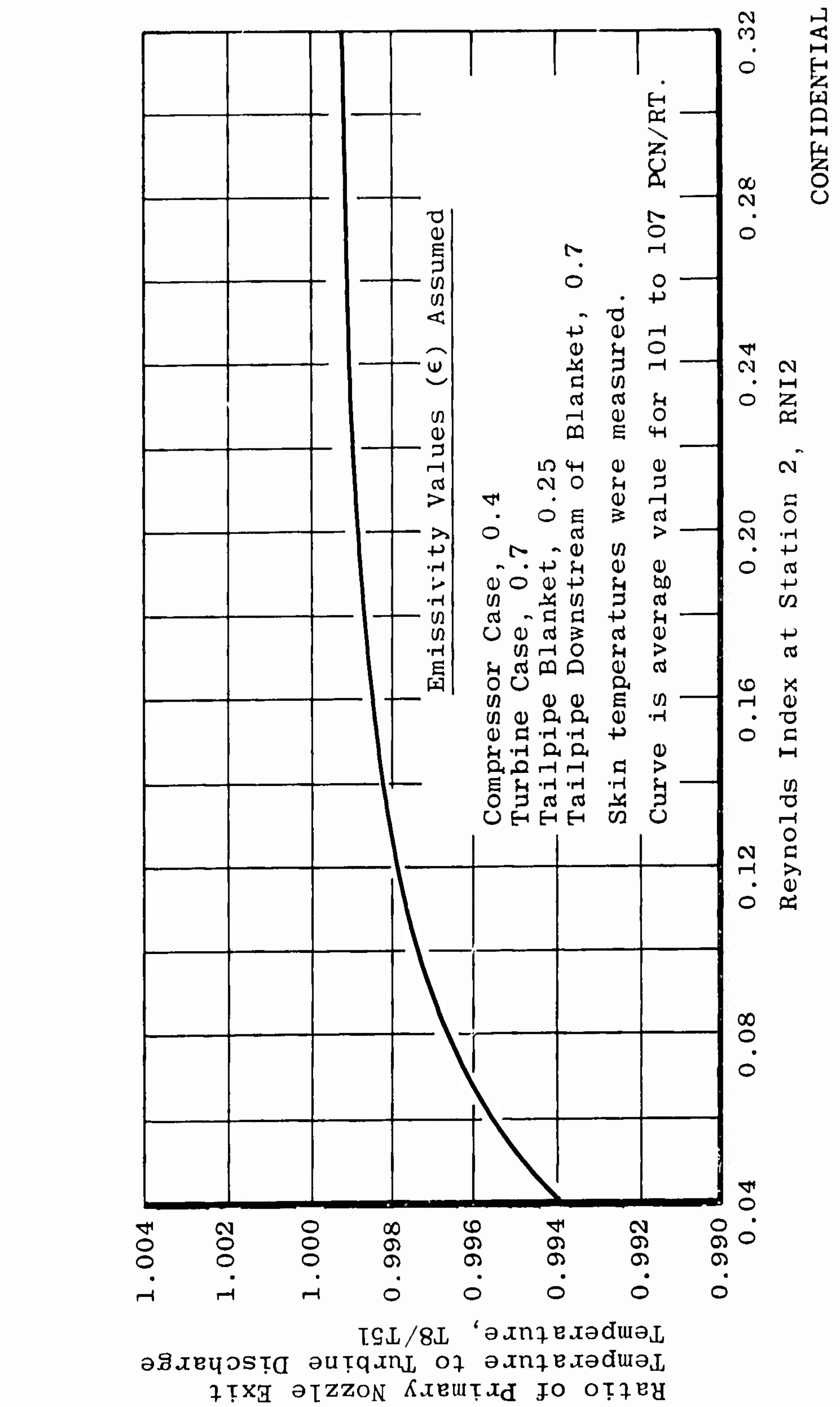

Fig. III-4 Ratio of T8/T51 for J97 Engine with Tailpipe Blanket and without Secondary Nozzle

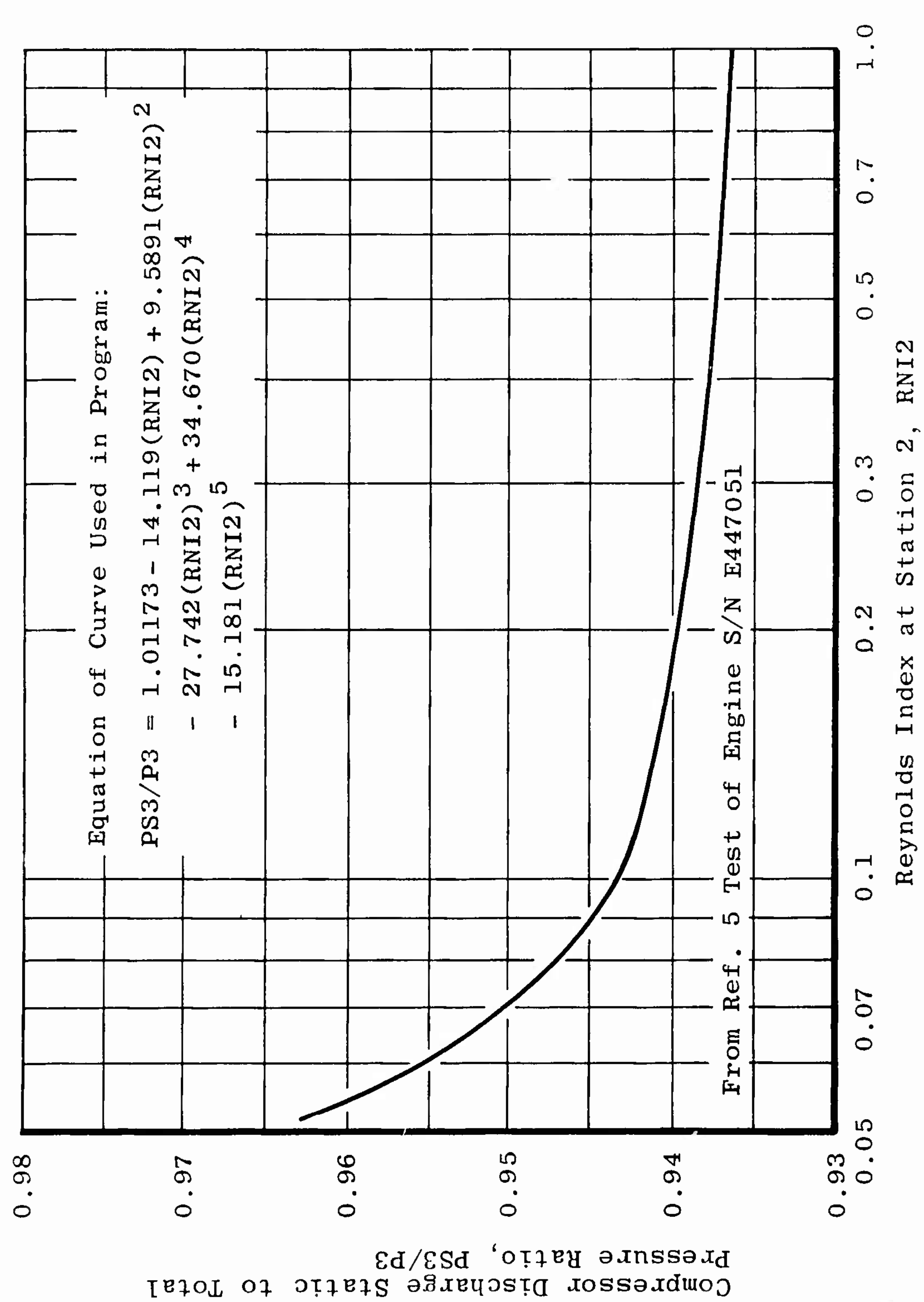

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Fig. III-5 Compressor Discharge Static to Total Pressure Ratio

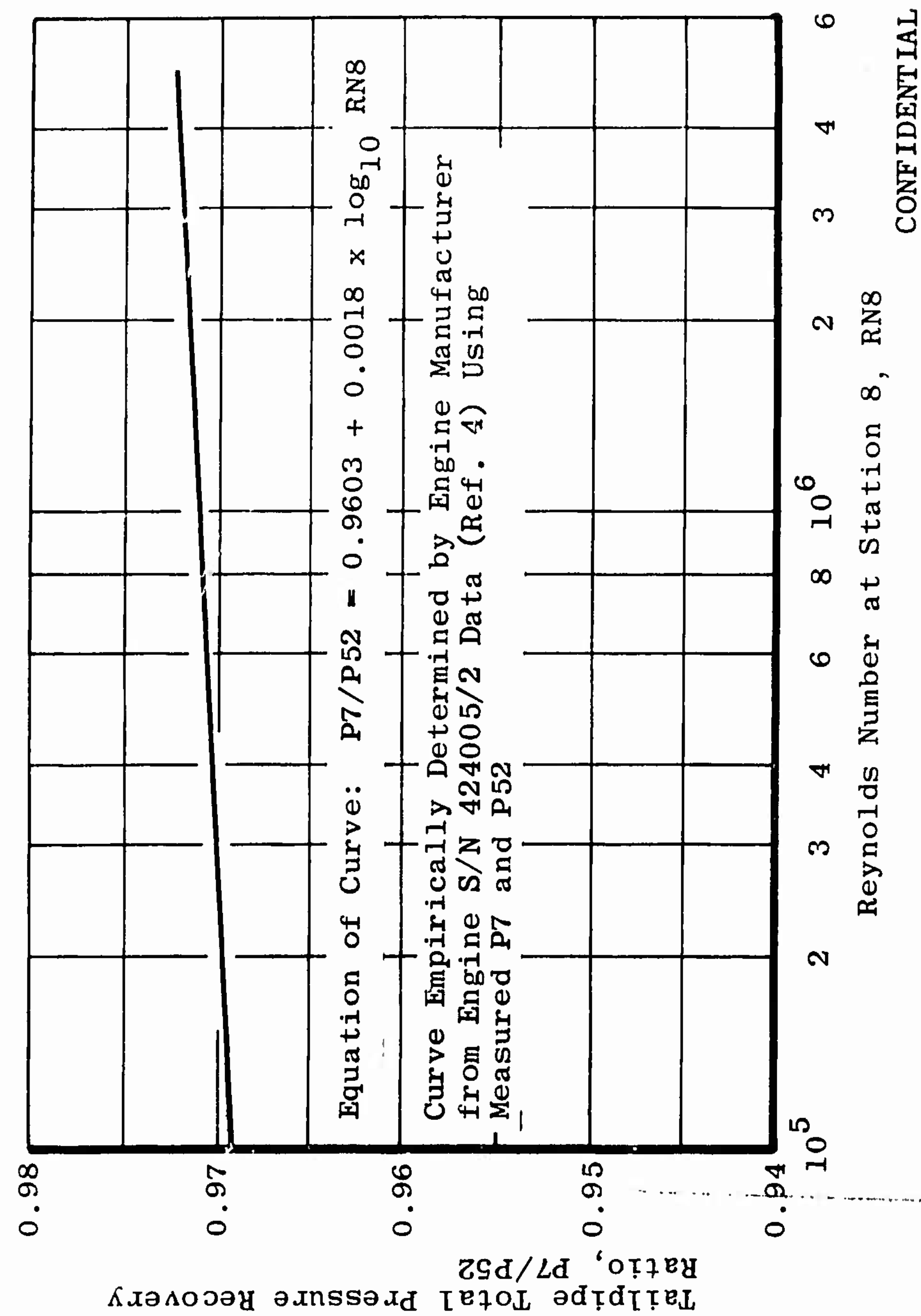

Fig. III-6 Predicted Tailpipe Total Pressure Recovery

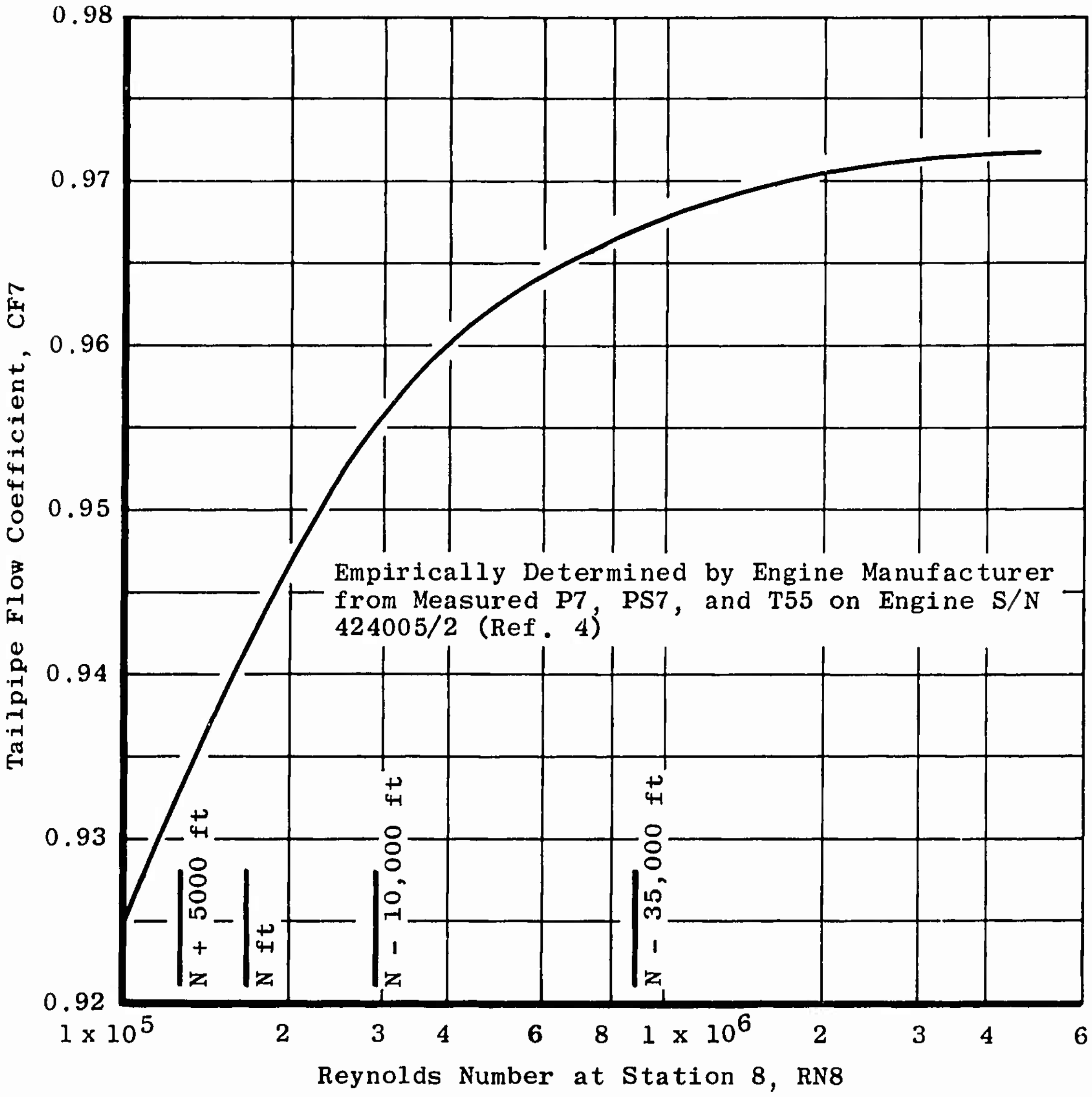

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Fig. III-7 Tailpipe Flow Coefficient as a Function of RN8

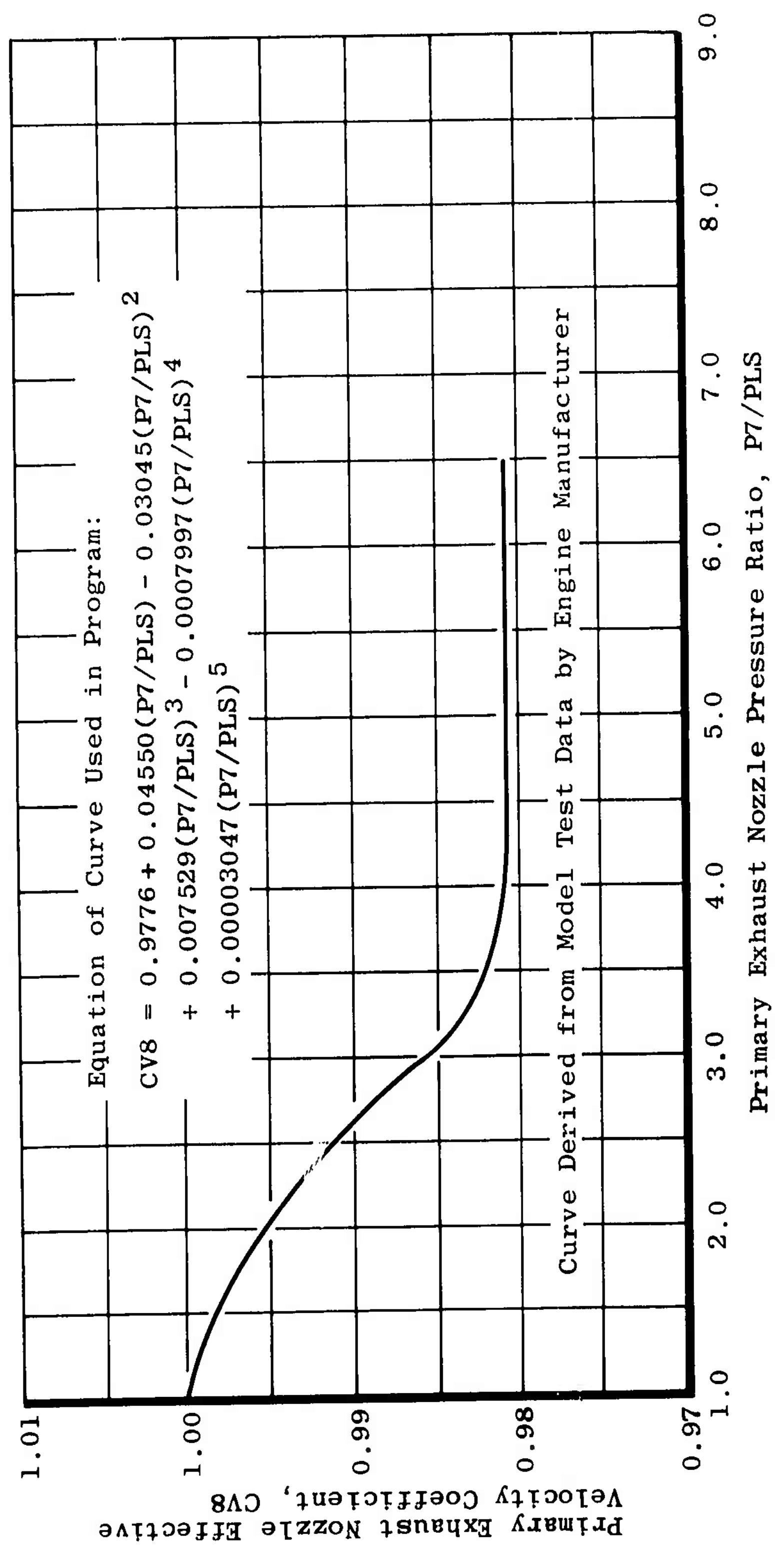

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Fig. III-8 Primary Exhaust Nozzle Effective Velocity Coefficient

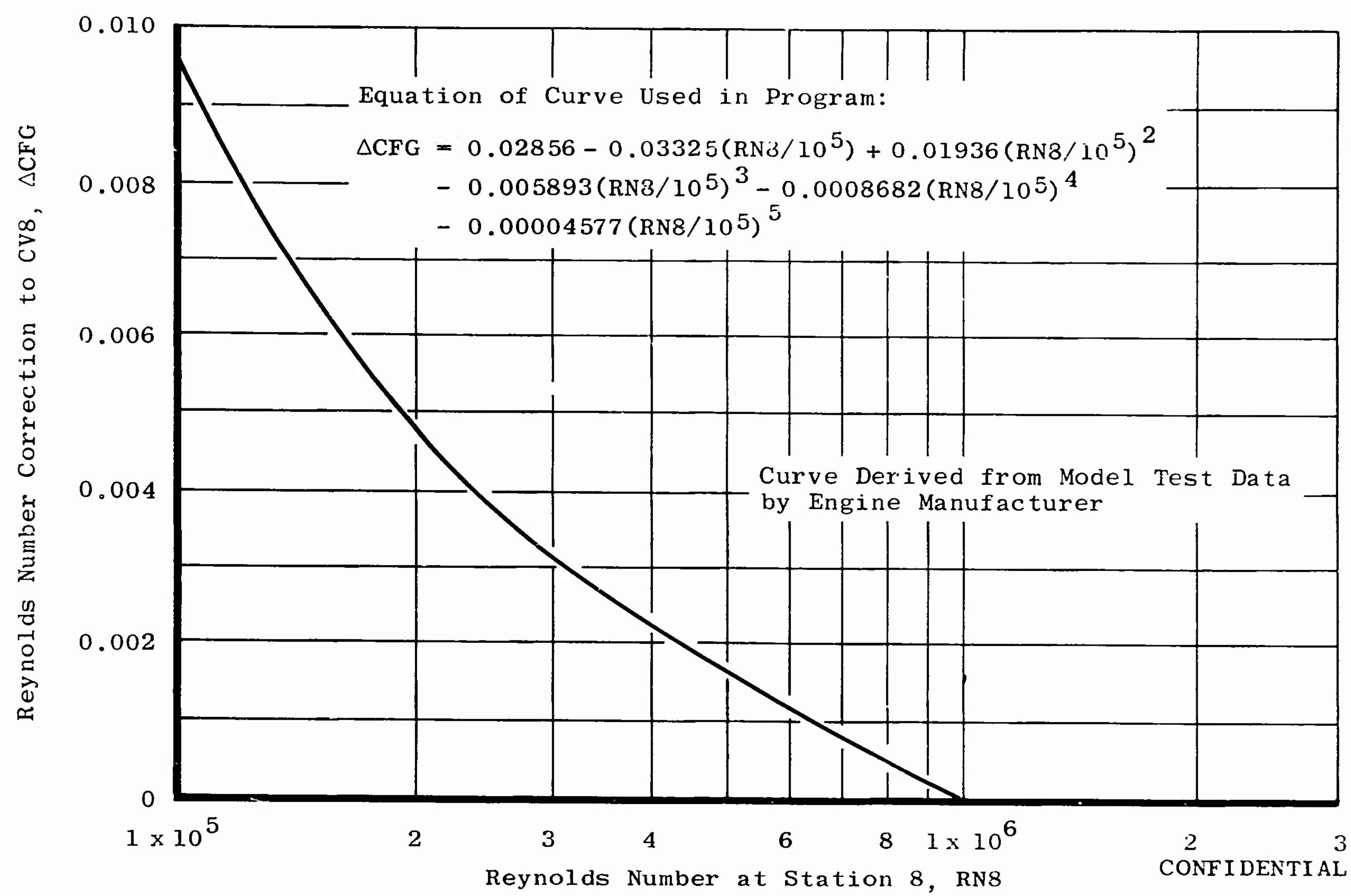

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Fig. III-9 Reynolds Number Effect on CV8

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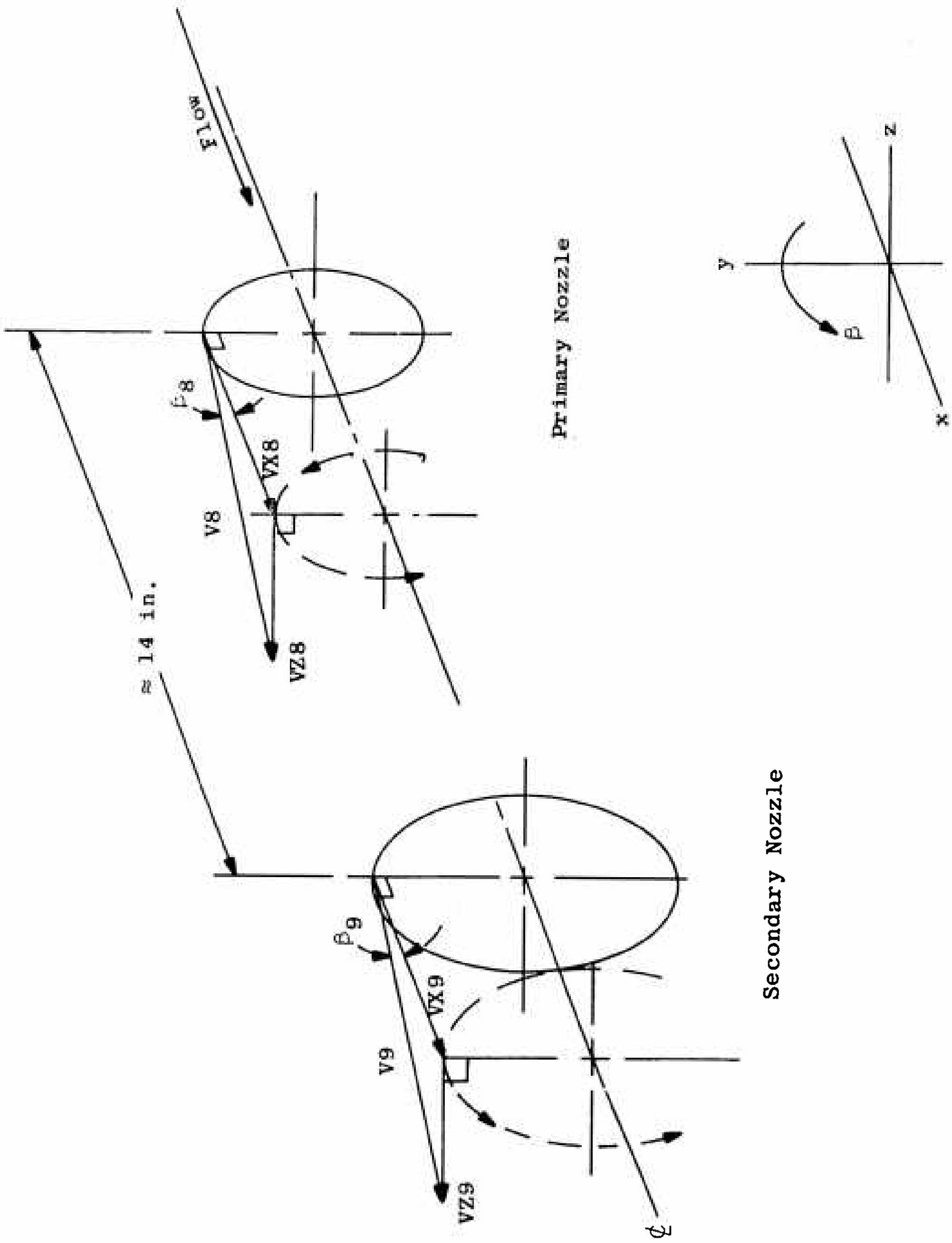

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Fig. III-10 Diagram of Exhaust Gas Swirl Vectors

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APPENDIX IV
TABULATED STEADY-STATE DATA

(U) Each set of test data is identified as shown in the following:

Heading	Definition
Date 5/24/68	Final computer run date May 24, 1968
Group 1	Downgrading classification
ARO, Inc. Arnold Air Force Station, Tennessee 37389	ARO address
CONFIDENTIAL	Security classification
T-4 Test Cell RD0820-10	Test number identified as: T-4 Test Cell RD0820 Project number 10 Test number
Offline	Computed offline
Run date 05-24-68	Date test data obtained
Time, 1138 hr, 14 sec	Time of day data were computed
Configuration 3.2	Data reduction computer program configuration number
Data point 7.0	Data point number 7.0

(U) Values are listed showing the sign, four significant digits, and the sign and associated power of 10; e.g.,

$$0.9548 - 01 = 0.9548 \times 10^{-1} = 0.09548$$

and

$$-0.9548 + 02 = 0.9548 \times 10^{2} \quad [illegible]5.48$$

INDEX TO
APPENDIX IV
CALCULATED DATA

Test Number - Data Point Number	Altitude, ft	Mach Number	Percent Corrected Rotor Speed
10-7	N - 34, 160	0.6498	106.7
10-8	N - 34, 930	0.5982	106.0
10-9	N - 34, 890	0.5947	105.5
10-10	N - 35, 180	0.6015	106.2
11-4	N - 10, 040	0.7912	103.0
11-5	N - 9220	0.8308	102.4
11-6	N - 9730	0.8070	102.7
11-7	N - 10, 190	0.8199	104.5
11-8	N - 9570	0.8259	104.6
11-9	N - 10, 090	0.8006	104.9
11-10	N - 10, 190	0.7954	106.6
11-11	N - 10, 110	0.7987	106.6
11-12	N - 10, 300	0.7898	106.6
11-13	N - 10, 240	0.7935	106.6
11-14	N - 10, 070	0.8024	106.5
11-19	N - 602	0.7943	106.5
11-20	N - 350	0.7944	106.5
11-21	N - 600	0.7843	106.7
11-22	N - 100	0.8086	105.0
11-23	N - 370	0.7958	105.1
11-24	N - 490	0.7896	105.4
11-25	N - 390	0.7963	103.3
11-26	N - 500	0.7929	103.4
11-27	N - 480	0.7976	103.3

Test Number Data Point Number	Altitude, ft	Mach Number	Percent Corrected Rotor Speed
11-28	N + 3990	0.8689	105.0
11-30	N + 5690	0.8540	105.1
11-31	N + 5760	0.8565	105.0
11-32	N + 5880	0.8632	106.6
11-33	N + 6080	0.8613	106.6
11-34	N + 6170	0.8622	106.7
11-35	N + 5940	0.9351	105.7
11-36	N + 6770	0.9704	106.0
11-37	N + 4510	0.8743	103.9
11-38	N + 4040	0.8529	103.2
11-39	N + 5080	0.8535	102.2
11-40	N + 4940	0.8474	101.8
13-7	N + 5790	0.9014	106.1
13-12	N + 6220	0.9040	106.2
13-22	N + 6530	0.9088	106.1
13-32	N + 6750	0.9245	106.1

PERFORMANCE PRINTOUT NOMENCLATURE

Tabulated Data Symbol	Report Symbol	Parameter
(ALT)D		Altitude (calculated), ft
(MO)D		Free-stream Mach number (calculated)
DTO	DTO	Off-standard temperature, ±°F
PLA		Power lever angle, deg
N	N	Rotor speed, rpm
PCN	PCN	Percent rotor speed
FS	FS	Scale force axial, lb_f
WFE	WF	Engine fuel flow, lb_m/hr
S.A.	β	Stator angle, deg
HL	h_L	Lower heating value of fuel, Btu/lb_m
WCW	WCW	Lube cooling water flow, lb_m/hr
TT1D	TT1D	Inlet plenum total temperature, °R
T2	T2	Compressor inlet total temperature, °R
T3	T3	Compressor discharge total temperature, °R
T3.9CALC	T39X	Combustor discharge total temperature (calculated), °R
T4CALC	T4X	Turbine inlet total temperature (calculated), °R
T5.0CALC	T5X	Turbine discharge temperature based on assumed ηb, °R
T5.1CALC	T51X	Turbine discharge temperature (calculated), °R, at station 5.1
T5.5AVG	T55	Turbine discharge temperature based on harness, °R

Tabulated Data Symbol	Report Symbol	Parameter
POO	POO	Average venturi inlet pressure, psia
PSINA	PSINA	Small venturi throat static pressure, psia
PSINB	PSINB	Large venturi throat static pressure, psia
PSI	PSI	Static pressure in plane of labyrinth seal, psia
P2	P2	Compressor inlet total pressure, psia
PS2	PS2	Compressor inlet static pressure, psia
P2DIST		Percent difference between maximum and minimum P2
P3X	P3X	Calculated compressor discharge total pressure, psia
PS3	PS3	Compressor discharge static pressure, psia
PS3CALC	PS3X	Calculated compressor discharge static pressure, psia
P4CALC	P4X	Turbine inlet total pressure (calculated), psia
P5.2	P52	Turbine discharge total pressure, psia
P7	P7	Nozzle inlet total pressure, psia
PLS		Exhaust nozzle lip static pressure, psia
PO	P_o	Test cell pressure, psia
PSINA/POO		Small venturi throat pressure ratio
PSINB/POO		Large venturi throat pressure ratio
P2/PO		Compressor inlet/test cell pressure ratio

Tabulated Data Symbol	Report Symbol	Parameter
P3/P2	P3/P2	Compressor pressure ratio
PS3/P3		Compressor discharge static/total pressure ratio
P3/P5.2		Compressor discharge/turbine discharge pressure ratio
P4/P3GE		Calculated turbine inlet to compressor discharge pressure ratio
P5.2/P2	P52/P2	Turbine discharge to compressor inlet pressure ratio
P5.2/PO		Turbine discharge to test cell pressure ratio
P7/PO	$P7/P_o$	Nozzle pressure ratio
T3/T2	T3/T2	Compressor temperature ratio
T5.1CALC/T2	T51X/T2	Engine temperature ratio
WAINA	WAINA	Small venturi airflow, lb_m/sec
WAINB	WAINB	Large venturi airflow, lb_m/sec
WAIN	WAIN	Total venturi measured airflow, lb_m/sec
WA2GE		Station 2 measured airflow, lb_m/sec
WC3	WC3	Cooling air removed from Wa_3 dumped into Wg 5.0, lb_m/sec
WC4	WC4	Cooling air removed from Wa_3 dumped into Wg 4.0, lb_m/sec
WA3.1	W31	Combustor inlet airflow, lb_m/sec
PS8/P7		Nozzle throat static/nozzle inlet total pressure ratio
WA5.1		Turbine discharge airflow, lb_m/sec
WG3.9	W39	Combustor discharge gas flow, lb_m/sec
WG4	W4	Turbine inlet gas flow, lb_m/sec

Tabulated Data Symbol	Report Symbol	Parameter
WG5.1	W51	Turbine discharge gas flow, lb_m/sec
WG8	W8	Primary nozzle gas flow, lb_m/sec
WA4		Turbine inlet airflow, lb_m/sec
FE3.9	F39	Fuel air ratio combustor exit
FE4	F4	Fuel air ratio turbine inlet
FE5.1	F51	Fuel air ratio turbine exit
HPE		Not used
QSW	QSW	Heat absorbed by water in oil cooler, Btu/hr
EFFCOMP	ETAC	Compressor efficiency
EFFBURN		Burner efficiency based on calculated T5.1
EFFTURB	ETAT	Turbine efficiency
EFFROTOR		Rotor efficiency
WAIN/WA2GE		Venturi measured/station 2 measured airflow ratio
DH4-5/T4		Enthalpy drop across turbine/T4CALC, Btu/sec-°R
VR3		Combustor reference velocity, ft/sec
CIP		Combustor inlet parameter, $lb_f/sec\text{-}in.^4$
WRT/P4CALC		Flow parameter, $W\sqrt{T}/P$, turbine inlet
WRT/P5.2		Flow parameter, $W\sqrt{T}/P$, turbine discharge
TPL5.2		Tailpipe pressure loss parameter, (P5.2 - P7)/P5.2
M1	M1	Inlet duct Mach number
M3	M3	Mach number at compressor exit

Tabulated Data Symbol	Report Symbol	Parameter
M5.2	M52	Mach number at turbine diffuser exit
M3EFF		Effective Mach number at compressor discharge
RNI2	RNI2	Reynolds number index at compressor inlet
RN4	RN4	Reynolds number at turbine inlet
RN8	RN8	Reynolds number at exhaust nozzle throat
RNI4GE		Reynolds number index at turbine inlet (GE-supplied equation)
DELTA2	δ	Ratio of compressor inlet total pressure to sea-level standard atmospheric pressure
THETA2	θ	Ratio of compressor inlet total temperature to sea-level standard atmospheric temperature
VO	VO	Free-stream velocity, ft/sec
VOK		Free-stream velocity, knots
FJS	FJS	Scale force jet thrust, lb_f
FR	FD	Ram drag, lb_f
FNS	FNS	Measured axial net thrust, lb_f
SFC	SFC	Specific fuel consumption, lb_m/lb_f-hr
FJCN	FJCN	Conical nozzle isentropic jet thrust, lb_f
CFJCN	CFJCN	Conical nozzle thrust coefficient
A8EFF	AE8	Effective primary nozzle area, $in.^2$
A8HOT	A8H	Hot primary nozzle area, $in.^2$

Tabulated Data Symbol	Report Symbol	Parameter
TOD		Calculated test cell ambient temperature, °R
POD		Calculated test cell ambient pressure, psia
P7X	P7X	Calculated station 7 total pressure based on PS7, psia
FJSD		Measured jet thrust corrected for error in cell pressure, lb_f
FNSD		Measured net thrust corrected for error in cell pressure, lb_f
SFCD		Specific fuel consumption corrected for error in cell pressure, lb_m/lb_f-hr
NC2	N/RT	Corrected rotor speed, rpm
WAINC	W*	Corrected engine airflow, lb_m/sec
FE5.1C		Corrected fuel air ratio at turbine discharge
WFEC	WF*	Corrected engine fuel flow, lb_m/hr
FJSC		Corrected axial jet thrust, lb_f
FNSC		Corrected axial net thrust, lb_f
SFCC		Corrected specific fuel consumption, lb_m/lb_f-hr
PCNC	PCN/RT	Percent corrected rotor speed
P3C		Corrected compressor discharge pressure, psia
P5.2C		Corrected turbine discharge pressure, psia
P7C		Corrected nozzle inlet pressure, psia
T3C		Corrected compressor discharge temperature, °R
T5.1C	T51*	Corrected turbine discharge temperature, °R

Tabulated Data Symbol	Report Symbol	Parameter
N/RT4		Corrected turbine rotor speed, rpm
WSRT/WPRT		Not used
EFFBURNGE	ETABM	Burner efficiency based on fuel flow and GE-provided curve
T4CGE		Turbine inlet temperature calculated from GE burner efficiency (corrected), °R
T5. 1CGE		Turbine discharge temperature based on GE burner efficiency (corrected), °R
FNSCGE		Corrected measured net thrust (GE method), lb_f
WFECGE		Corrected engine fuel flow (GE method), lb_m/hr
SFCCGE		Corrected specific fuel consumption (GE method)
M8V8	M8V8	Momentum of exhaust nozzle, lb_f
PS8A8	PS8(A8H)	Pressure area term of exhaust nozzle, lb_f
FJMMB/FJS		Calculated/measured jet thrust ratio
T8/T5.5	T8/T55	Calculated/measured nozzle inlet temperature, °R
DPLS		Pressure difference between first and second groove of engine inlet labyrinth seal, psid
PEA8H	P_o(A8H)	Pressure area term of exhaust nozzle, lb_f
POSTB		Difference between average and rear cell pressure measurement, psid
FJMMB	FJMMB	Jet thrust by momentum balance method, lb_f

Tabulated Data Symbol	Report Symbol	Parameter
FNMMB	FNMMB	Net thrust by momentum balance method, lb_f
SFCMMB		Specific fuel consumption by momentum balance method, lb_m/lb_f-hr
FJMMBD		Jet thrust by momentum balance method, corrected for error in cell pressure, lb_f
FNMMBD		Net thrust by momentum balance method, corrected for error in cell pressure, lb_f
SFCMMBD		Specific fuel consumption based on momentum balance method, corrected for error in cell pressure, lb_m/lb_f-hr
FJMMBC		Corrected jet thrust based on momentum balance method, lb_f
FNMMBC		Corrected net thrust based on momentum balance method, lb_f
SFCMMBC		Corrected specific fuel consumption based on momentum balance method, lb_m/lb_f-hr
FNMMBCGE		Net thrust based on momentum balance, corrected by GE method, lb_f
SFCMMBCGE		Specific fuel consumption based on momentum balance method, corrected by GE method, lb_m/lb_f-hr
WHF		Not used
WA2GEC		Station 2.0 calculated airflow (corrected), lb_m/sec
PSLS		Labyrinth seal cavity pressure, psia

Tabulated Data Symbol	Report Symbol	Parameter
PS2W		Station 2.0 wall static pressure, psia
PS7	PS7	Station 7 static pressure, psia
CD		Station 8 discharge coefficient
P2P		Test cell inlet plenum chamber static pressure, psia
D-DPOO(+)		Maximum deviation of DPOO above DPOO average, psid
D-DPOO(+)		Maximum deviation of DPOO below DPOO average, psid
D-DPOO-I(+)		Maximum deviation of DPOO-I above DPOO-I average, psid
D-DPOO-I(-)		Maximum deviation of DPOO-I below DPOO-I average, psid
D-DPO(+)		Maximum deviation of DPO above DPO average, psid
D-DPO(-)		Maximum deviation of DPO below DPO average, psid
DPOO AV		Average change in venturi inlet pressure over the time required to record each data point, psid
DPOO IAV		Average change in venturi inlet pressure over the time required to record each data point, psid
DPO AV		Average change in test cell pressure over the time required to record each data point, psid
T8	T8	Exhaust nozzle inlet temperature, adjusted for engine thermal losses, °R
CFJSV	CFJSV	Stream thrust parameter
P8	P8	Measured station 8 pressure, psia

DATE= 5/24/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-10 RUN DATE 05-24-68 TIME 1158 HRS 14 SEC CONFIGURATION 3.2 DATA PT. 7.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	HL
N-34160.	.6498+00	.0000+00	.0000+00	.1315+05	.9632+02	.9756+03	.9905+03	.5152+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.1737+01	.4119+03	.4229+03	.1046+04	.2144+04	.2091+04	.1516+04	.1485+04	.1461+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.8765+01	.4256+01	.4385+01	.3040+01	.3434+01	.2792+01	.1659+01	.5015+02	.4708+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.4728+02	.4783+02	.1046+02	.1016+02	.2728+01					.2729+01
PSINA/P00	PSINB/P00	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4855+00	.5002+00	.1258+01	.1460+02	.9387+00	.4792+01	.9538+00	.3047+01	.3835+01	.3723+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2474+01	.3512+01	.7086+01	.1143+02	.1852+02	.1875+02	.1296+01	.9147+00	.1631+02	.2685+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.1852+02					.1658+02	.1749+02	.1879+02	.1879+02	.1722+02
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.1687-01	.1598-01	.1486-01	.0000+00	.1792+02	.7589+00	.9914+00	.8840+00	.8265+00	.9875+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7687-01	.6194+02	.1359+03	.1672+02	.6920+02	.2901-01	.4292+00	.3047+00	.5359+00	
	M3EFF	RN12	RN4	RN8	RN14GE	DELTA2	THETA2	VO	VOK
	.2942+00	.3046+00	.7967+05	.8686+06	.3006+00	.2337+00	.8153+00	.5801+03	.3437+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POC
.1331+04	.3339+03	.9974+03	.9931+00	.1371+04	.9712+00	.1360+03	.1408+03	.3900+03	.2612+01
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.9992+01		.1347+04	.9848+03	.1006+01	.1456+05	.7155+02	.1823-01	.4695+04	.5697+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4269+04	.1100+01	.1067+03	.2146+03	.4478+02	.4348+02	.1283+04	.1822+04	.2676+03	.0000+00

OFFLINE

P8 RAKE IN THRUST VOID

DATE= 5/24/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

J-4 TEST CELL RD0820-10 RUN DATE 05-24-68 TIME 1138 HRS 14 SEC CONFIGURATION 3.2 DATA PT. 7.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	FS8A8	
.9850+00	.2570+04	.1825+04	.4304+04	.4878+04	.1134+01		.9797+03	.7702+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.1024+01	.1016+01	-.1516-01	.3843+03	-.2895-01			.1363+04	.1029+04	.9827+00
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.1379+04	.1017+04	.9743+00	.5832+04	.4403+04	.1066+01	.4440+04	.1099+01	.0000+00	.7246+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.3192+01	.2800+01	.7893+01	.9655+00	.3451+01	.1451-01	-.1212-01	.8324-03	-.9186-03	.1677-01
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.2748-01	-.1451-01	-.3648-03	.1140-01	.1484+04	.1199+01				

OFFLINE

DATE= 5/24/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-10 RUN DATE 05-24-68 TIME 1139 HRS 48 SEC CONFIGURATION 3.2 DATA PT. 8.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	HL
N-34930.	.5982+00	.0000+00	.0000+00	.1313+05	.9623+02	.1021+04	.9895+03	.5156+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.7216+00	.4065+03	.4179+03	.1037+04	.2131+04	.2078+04	.1507+04	.1478+04	.1455+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.8740+01	.4240+01	.4363+01	.3023+01	.3418+01	.2780+01	.1992+01	.5009+02	.4702+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.4722+02	.4777+02	.1044+02	.1014+02	.2745+01					.2744+01
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4852+00	.4992+00	.1246+01	.1465+02	.9387+00	.4796+01	.9538+00	.3055+01	.3807+01	.3696+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	P68/P7
.2481+01	.3533+01	.7113+01	.1147+02	.1859+02	.1876+02	.1301+01	.9181+00	.1637+02	.2707+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.1859+02					.1664+02	.1756+02	.1886+02	.1886+02	.1728+02
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.1679-01	.1590-01	.1479-01	.0000+00	.1260+02	.7674+00	.9914+00	.8824+00	.8249+00	.9905+00
DH4-5/T4	VH3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7674-01	.6168+02	.1351+03	.1675+02	.6938+02	.2900-01	.4306+00	.3048+00	.5378+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2943+00	.3081+00	.8026+05	.8751+06	.3023+00	.2326+00	.8056+00	.5650+03	.3348+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	PUD
.1366+04	.3264+03	.1040+04	.9514+00	.1369+04	.9983+00	.1363+03	.1408+03	.3900+03	.2711+01
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.9981+01		.1371+04	.1036+04	.9547+00	.1463+05	.7172+02	.1836-01	.4740+04	.5875+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4472+04	.1060+01	.1072+03	.2154+03	.4490+02	.4360+02	.1287+04	.1832+04	.2881+03	.0000+00

OFFLINE

DATE= 5/24/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-10 RUN DATE 05-24-68 TIME 2159 HRS 48 SEC CONFIGURATION 3.2 DATA PT. 8.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PSBAB	
.9850+00	.2585+04	.1836+04	.4510+04	.4936+04	.1094+01		.9806+03	.7684+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.9952+00	.1014+01	-.4813-02	.3863+03	-.3875-01			.1360+04	.1034+04	.9573+00
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.1364+04	.1030+04	.9608+00	.5847+04	.4444+04	.1067+01	.4482+04	.1101+01	.0000+00	.7241+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.3170+01	.2787+01	.7871+01	.9679+00	.3434+01	.1067-01	-.9970-02	.6583-03	-.5654-03	.1769-01
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.1567-01	-.1067-01	-.5140-03	.8843-02	.1475+04	.1227+01				

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DATE= 5/24/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-10 RUN DATE 05-24-68 TIME 1141 HRS 22 SEC CONFIGURATION 3,2 DATA PT. 9.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	HL
N-34890.	.5947+00	.0000+00	.0000+00	.1311+05	.9605+02	.1013+04	.9818+03	.5153+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.4970+01	.4066+03	.4176+03	.1035+04	.2124+04	.2071+04	.1501+04	.1470+04	.1452+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.8724+01	.4243+01	.4335+01	.3005+01	.3403+01	.2773+01	.2781+01	.4980+02	.4675+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.4693+02	.4748+02	.1039+02	.1008+02	.2739+01					.2720+01
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4863+00	.4969+00	.1251+01	.1463+02	.9387+00	.4795+01	.9535+00	.3052+01	.3818+01	.3707+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2480+01	.3522+01	.7098+01	.1145+02	.1855+02	.1863+02	.1298+01	.9162+00	.1633+02	.2716+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.1855+02					.1661+02	.1752+02	.1882+02	.1882+02	.1725+02
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.1670-01	.1581-01	.1470-01	.0000+00	-.6795+02	.7578+00	.9914+00	.8839+00	.8258+00	.9954+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7684-01	.6182+02	.1338+03	.1679+02	.6949+02	.2900-01	.4409+00	.3048+00	.5389+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VCK
	.2953+00	.3070+00	.8024+05	.8754+06	.3015+00	.2316+00	.8050+00	.5696+03	.3375+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	PUD
.1366+04	.3284+03	.1038+04	.9463+00	.1364+04	.1001+01	.1365+03	.1408+03	.3900+03	.2706+01
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.9960+01		.1368+04	.1036+04	.9477+00	.1461+05	.7187+02	.1527-01	.4726+04	.5699+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSR1/WPRT
.4481+04	.1055+01	.1071+03	.2151+03	.4485+02	.4355+02	.1286+04	.1627+04	.2881+03	.0000+00

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DATE= 5/24/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-10 RUN DATE 05-24-68 TIME 1141 HRS 22 SEC CONFIGURATION 3,2 DATA PT. 9.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9850+00	.2578+04	.1831+04	.4520+04	.4923+04	.1089+01		.9767+03	.7638+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9918+00	.1012+01	.5692-03	.3829+03	-.7391-02			.1355+04	.1026+04	.9565+00
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.1357+04	.1025+04	.9580+00	.5851+04	.4433+04	.1066+01	.4472+04	.1101+01	.0000+00	.7220+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.3168+01	.2757+01	.7872+01	.9696+00	.3434+01	.1508-01	-.1076-01	.8540-03	-.1310-02	.1653-01
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1375-01	-.1508-01	.1508-03	-.7553-02	.1469+04	.1232+01				

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GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-10 RUN DATE 05-24-68 TIME 1142 HRS 58 SEC CONFIGURATION 3,2 DATA PT. 10.0

(ALT)D N-35180.	(MO)D .6015+00	DTO .0000+00	PLA .0000+00	N .1312+05	PCN .9609+02	FS .1023+04	WFE .9991+03	SA .5153+02	WL .1861+05
WCW .1049+01	TT1D .4082+03	T2 .4182+03	T3 .1038+04	T3.9CALC .2123+04	T4CALC .2070+04	T5.0CALC .1499+04	T5.1CALC .1468+04	T5.5AVG .1453+04	
	PUO .8919+01	PSINA .4309+01	PSINB .4439+01	PSI .3083+01	P2 .3469+01	PS2 .2825+01	P2DIST .1763+01	P3X .5088+02	PS3 .4776+02
PS3CALC .4795+02	P4CALC .4852+02	P5.2 .1059+02	P7 .1028+02	PLS .2742+01					PO .2741+01
PSINA/PUO .4831+00	PSINB/PUO .4977+00	P2/PO .1266+01	P3/P2 .1467+02	PS3/P3 .9386+00	P3/P5.2 .4807+01	P4/P3GE .9535+00	P5.2/P2 .3051+01	P5.2/PO .3862+01	P7/PO .3750+01
T3/T2 .2481+01	T5.1CALC/T2 .3511+01	WAINA .7243+01	WAINB .1168+02	WAIN .1893+02	WA2GE .1899+02	WC3 .1325+01	WC4 .9350+00	WA3.1 .1667+02	PS8/P7 .2667+00
WA5.1 .1893+02					WG3.9 .1694+02	WG4 .1788+02	WG5.1 .1920+02	WG8 .1920+02	WA4 .1760+02
FE3.9 .1665-01	FE4 .1577-01	FE5.1 .1466-01	HPE .0000+00	QSW .3668+02	EFFCOMP .7678+00	EFFBURN .9914+00	EFFTURB .8854+00	EFFROTOR .8266+00	WAIN/WA2GE .9964+00
DH4-5/T4 .7708-01	VR3 .6187+02	CIP .1369+03	WRT/P4CALC .1677+02	WRT/P5.2 .6952+02	TPL5.2 .2899-01	M1 .4246+00	M3 .3049+00	M5.2 .5391+00	
	M3EFF .2952+00	RNI2 .3123+00	RN4 .8189+05	RN8 .8941+06	RNI4GE .3082+00	DELTA2 .2360+00	THETA2 .8062+00	VO .5836+03	VOK .3458+03
FJS .1391+04	FR .3433+03	FNS .1047+04	SFC .9539+00	FJCN .1395+04	CFJCN .9967+00	ABEFF .1365+03	ABHOT .1408+03	TOD .3900+03	POD .2744+01
P7X .1013+02		FJSD .1390+04	FNSD .1048+04	SFCD .9536+00	NC2 .1461+05	WAINC .7200+02	FE5.1C .1819-01	WFEC .4714+04	FJSC .5892+04
FNSC .4437+04	SFCC .1062+01	PCNC .1070+03	P3C .2156+03	P5.2C .4485+02	P7C .4355+02	T3C .1287+04	T5.1C .1821+04	N/RT4 .2883+03	WSRT/WPKT .0000+00

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DATE= 5/24/68
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ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-10 RUN DATE 05-24-68 TIME 1142 HRS 58 SEC CONFIGURATION 3.2 DATA PT. 10.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9850+00	.2574+04	.1825+04	.4475+04	.4909+04	.1097+01		.9956+03	.7787+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9964+00	.1010+01	-.1056-01	.3859+03	-.2266-01			.1386+04	.1042+04	.9585+00
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.1385+04	.1043+04	.9581+00	.5871+04	.4416+04	.1067+01	.4454+04	.1102+01	.0000+00	.7225+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.3217+01	.2828+01	.7973+01	.9696+00	.3490+01	.1278-01	-.8353-02	.7705-03	-.6622-03	.1552-01
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.3092-01	-.1278-01	-.5864-03	-.8315-02	.1467+04	.1227+01				

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DATE= 5/23/68
GROUP 1
ARO, INC,
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1015 HRS 53 SEC CONFIGURATION 3,2 DATA PT, 4,0

(ALT)D	(MD)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-10040.	,7912+00	,0000+00	,9291+02	,1293+05	,9476+02	,3336+03	,3746+03	,5065+02	,1861+05
WCW	TT1D	T2	T3	T3,9CALC	T4CALC	T5,0CALC	T5,1CALC	T5,5AVG	
,1603+01	,4186+03	,4388+03	,1090+04	,2296+04	,2238+04	,1647+04	,1611+04	,1562+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	,2985+01	,1443+01	,1470+01	,1094+01	,1226+01	,1018+01	,3024+01	,1748+02	,1648+02
PS3CALC	P4CALC	P5,2	P7	PLS					PO
,1651+02	,1669+02	,3685+01	,3575+01	,8638+00					,8640+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5,2	P4/P3GE	P5,2/P2	P5,2/PO	P7/PO
,4835+00	,4924+00	,1419+01	,1426+02	,9426+00	,4745+01	,9549+00	,3005+01	,4264+01	,4137+01
T3/T2	T5,1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3,1	PS8/P7
,2484+01	,3671+01	,2391+01	,3856+01	,6247+01	,6342+01	,4373+00	,3086+00	,5501+01	,2417+00
WA5,1					WG3,9	WG4	WG5,1	WG8	WA4
,6247+01					,5606+01	,5914+01	,6351+01	,6351+01	,5810+01
FE3,9	FE4	FE5,1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
,1891-01	,1791-01	,1666-01	,0000+00	,4680+02	,7519+00	,9885+00	,8646+00	,8082+00	,9851+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5,2	TPL5,2	M1	M3	M5,2	
,7503-01	,6243+02	,4937+02	,1676+02	,6919+02	,2990-01	,4176+00	,2944+00	,5377+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	,2902+00	,1036+00	,2588+05	,2796+06	,9734-01	,8344-01	,8460+00	,7179+03	,4254+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
,4938+03	,1394+03	,3544+03	,1057+01	,4957+03	,9962+00	,1362+03	,1410+03	,3900+03	,8197+00
P7X		FJSD	FNSD	SFOD	NC2	WAINC	FE5,1C	WFEC	FJSC
,3526+01		,4998+03	,3511+03	,1067+01	,1406+05	,6887+02	,1969-01	,4881+04	,5916+04
FNSC	SFCC	PCNC	P3C	P5,2C	P7C	T3C	T5,1C	N/RT4	WSRT/WPRT
,4248+04	,1149+01	,1030+03	,2095+03	,4416+02	,4284+02	,1288+04	,1904+04	,2734+03	,0000+00

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1015 HRS 53 SEC CONFIGURATION 3.2 DATA PT. 4.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9822+00	.2650+04	.1908+04	.4276+04	.5037+04	.1178+01		.3437+03	.2719+03	
FJMM8/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMM8	FNMM8	SFCMM8
.9949+00	.1029+01	-.1824-01	.1218+03	.1277-02			.4913+03	.3519+03	.1065+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.4973+03	.3486+03	.1075+01	.5888+04	.4217+04	.1157+01	.4246+04	.1186+01	.0000+00	.6991+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1156+01	.1031+01	.2777+01	.9664+00	.1233+01	.1356-01	-.1024-01	.0000+00	.0000+00	.9931-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.1029-01	-.1356-01	.0000+00	-.6575-02	.1607+04	.1222+01				

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DATE= 5/23/68
GROUP 1
ARO, INC,
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1033 HRS 3 SEC CONFIGURATION 3,2 DATA PT. 5.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	HL
N- 9220.	.8308+00	.0000+00	.9306+02	.1293+05	.9474+02	.3261+03	.3739+03	.5065+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1285+01	.4324+03	.4439+03	.1099+04	.2311+04	.2253+04	.1658+04	.1622+04	.1573+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3015+01	.1457+01	.1484+01	.1100+01	.1227+01	.1019+01	.2578+01	.1743+02	.1643+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1645+02	.1664+02	.3654+01	.3545+01	.8473+00					.8471+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4833+00	.4923+00	.1448+01	.1421+02	.9427+00	.4769+01	.9547+00	.2979+01	.4314+01	.4185+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2476+01	.3654+01	.2377+01	.3833+01	.6210+01	.6289+01	.4347+00	.3068+00	.5468+01	.2390+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.6210+01					.5572+01	.5879+01	.6314+01	.6314+01	.5775+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.1899-01	.1798-01	.1672-01	.0000+00	.3722+02	.7538+00	.9905+00	.8625+00	.8081+00	.9874+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7506-01	.6278+02	.4935+02	.1677+02	.6959+02	.2990-01	.4090+00	.2943+00	.5424+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2906+00	.1021+00	.2563+05	.2768+06	.9633-01	.8347-01	.8558+00	.7410+03	.4390+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.4920+03	.1430+03	.3490+03	.1071+01	.4958+03	.9924+00	.1370+03	.1410+03	.3901+03	.7880+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.3510+01		.5001+03	.3448+03	.1084+01	.1398+05	.6883+02	.1954-01	.4842+04	.5895+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4181+04	.1158+01	.1024+03	.2088+03	.4378+02	.4347+02	.1284+04	.1895+04	.2725+03	.0000+00

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1033 HRS 3 SEC CONFIGURATION 3.2 DATA PT. 5.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9842+00	.2636+04	.1898+04	.4208+04	.4986+04	.1185+01		.3427+03	.2698+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9969+00	.1028+01	-.2997-02	.1194+03	.1297-03			.4905+03	.3475+03	.1076+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.4985+03	.3433+03	.1089+01	.5877+04	.4163+04	.1163+01	.4189+04	.1190+01	.0000+00	.6971+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1151+01	.1027+01	.2759+01	.9720+00	.1234+01	.1065-01	-.9914-02	.0000+00	.0000+00	.2076-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.2229-02	-.1065-01	.0000+00	.2668-04	.1618+04	.1224+01				

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1036 HRS 47 SEC CONFIGURATION 3.2 DATA PT. 6.0

(ALT)D N- 9730.	(MO)D .8070+00	DTO .0000+00	PLA .9307+02	N .1293+05	PCN .9471+02	FS .3179+03	WFE .3753+03	SA .5065+02	ML .1861+05
WCW -.1231+01	TT1D .4253+03	T2 .4408+03	T3 .1095+04	T3.9CALC .2304+04	T4CALC .2246+04	T5.0CALC .1652+04	T5.1CALC .1616+04	T5.5AVG .1568+04	
	POO .3011+01	PSINA .1455+01	PSINB .1484+01	PSI .1100+01	P2 .1227+01	PS2 .1019+01	P2DIST .2532+01	P3X .1757+02	PS3 .1657+02
PS3CALC .1660+02	P4CALC .1678+02	P5.2 .3675+01	P7 .3565+01	PLS .8508+00					PO .8512+00
PSINA/POO .4832+00	PSINB/POO .4926+00	P2/PO .1442+01	P3/P2 .1432+02	PS3/P3 .9427+00	P3/P5.2 .4782+01	P4/P3GE .9550+00	P5.2/P2 .2995+01	P5.2/PO .4318+01	P7/PO .4189+01
T3/T2 .2485+01	T5.1CALC/T2 .3665+01	WAINA .2394+01	WAINB .3860+01	WAIN .6254+01	WA2GE .6318+01	WC3 .4378+00	WC4 .3089+00	WA3.1 .5507+01	PS8/P7 .2386+00
WA5.1 .6254+01					WG3.9 .5611+01	WG4 .5920+01	WG5.1 .6358+01	WG8 .6358+01	WA4 .5016+01
FE3.9 .1893-01	FE4 .1792-01	FE5.1 .1667-01	HPE .0000+00	QSW .6132+02	EFFCOMP .7528+00	EFFBURN .9902+00	EFFTURB .8628+00	EFFROTOR .8078+00	WAIN/WA2GE .9898+00
DH4-5/T4 .7520-01	VR3 .6248+02	CIP .4983+02	WRT/P4CALC .1672+02	WRT/P5.2 .6953+02	TPL5.2 .2990-01	M1 .4087+00	M3 .2944+00	M5.2 .5417+00	
	M3EFF .2896+00	RNI2 .1031+00	RN4 .2586+05	RN8 .2794+06	RNI4GE .9750-01	DELTA2 .8349-01	THETA2 .8498+00	VO .7342+03	VUK .4350+03
FJS .4829+03	FR .1427+03	FNS .3402+03	SFC .1103+01	FJCN .4983+03	CFJCN .9690+00	ABEFF .1369+03	ABHOT .1410+03	TOD .3900+03	PUD .8074+00
P7X .3529+01		FJSD .4887+03	FNSD .3369+03	SFCD .1114+01	NC2 .1402+05	WAINC .6905+02	FE5.1C .1962-01	WFEC .4876+04	FJSC .5784+04
FNSC .4075+04	SFCC .1197+01	PCNC .1027+03	P3C .2105+03	P5.2C .4402+02	P7C .4271+02	T3C .1289+04	T5.1C .1901+04	N/RT4 .2728+03	WSRT/WPRT .0000+00

OFFLINE

P8 RAKE IN THRUST VOID

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1036 HRS 47 SEC CONFIGURATION 3.2 DATA PT. 6.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBVB	PSBAB	
.9839+00	.2647+04	.1904+04	.4102+04	.5028+04	.1226+01		.3445+03	.2713+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.1021+01	.1028+01	-.5271-02	.1200+03	.5799-03			.4932+03	.3505+03	.1071+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.4991+03	.3473+03	.1081+01	.5907+04	.4198+04	.1162+01	.4225+04	.1190+01	.0000+00	.6976+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1151+01	.1026+01	.2776+01	.9713+00	.1235+01	.8246-02	-.6353-02	.1244-02	-.7055-03	.2824-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.2184-02	-.8246-02	-.7905-04	-.2824-02	.1611+04	.1200+01				

OFFLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1049 HRS 39 SEC CONFIGURATION 3.2 DATA PT. 7.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-10190.	.8199+00	.0000+00	.9965+02	.1318+05	.9652+02	.3279+03	.4009+03	.5067+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.9951+00	.4273+03	.4424+03	.1109+04	.2345+04	.2286+04	.1682+04	.1645+04	.1602+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3145+01	.1519+01	.1548+01	.1136+01	.1271+01	.1051+01	.2530+01	.1849+02	.1742+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1747+02	.1766+02	.3872+01	.3756+01	.8231+00					.8234+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4830+00	.4923+00	.1544+01	.1454+02	.9426+00	.4774+01	.9553+00	.3046+01	.4702+01	.4562+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2508+01	.3719+01	.2494+01	.4021+01	.6515+01	.6589+01	.4560+00	.3218+00	.5737+01	.2191+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.6515+01					.5848+01	.6170+01	.6625+01	.6626+01	.6059+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.1941-01	.1838-01	.1710-01	.0000+00	.8000+02	.7469+00	.9914+00	.8642+00	.8055+00	.9887+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7532-01	.6268+02	.5292+02	.1670+02	.6942+02	.2987-01	.4138+00	.2946+00	.5409+00	
	M3EFF	RN12	RN4	RN8	RN14GE	DELTA2	THETA2	VO	VOK
	.2886+00	.1063+00	.2668+05	.2880+06	.1006+00	.8649-01	.8529+00	.7960+03	.4716+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	PUD
.5189+03	.1612+03	.3570+03	.1123+01	.5343+03	.9698+00	.1368+03	.1411+03	.3900+03	.8257+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.3720+01		.5179+03	.3572+03	.1122+01	.1427+05	.6956+02	.2004+01	.5019+04	.5991+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4128+04	.1216+01	.1045+03	.2137+03	.4476+02	.4343+02	.1301+04	.1929+04	.2756-03	.0000+00

ONLINE

P8 RAKE IN THRUST VOID

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1049 HRS 39 SEC CONFIGURATION 3.2 DATA PT. 7.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9850+00	.2684+04	.1932+04	.4154+04	.5172+04	.1245+01		.3621+03	.2862+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.1022+01	.1024+01	-.2119-02	.1161+03	-.5765-03			.5294+03	.3682+03	.1089+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.5291+03	.3684+03	.1088+01	.6121+04	.4257+04	.1179+01	.4284+04	.1207+01	.0000+00	.7036+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1183+01	.1061+01	.2927+01	.9695+00	.1278+01	.1358-01	-.1066-01	.5615-03	-.5252-03	.1346-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.2148-02	-.1358-01	.5252-03	.7367-03	.1641+04	.1197+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1103 HRS 16 SEC CONFIGURATION 3.2 DATA PT. 8.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N- 9570.	.8259+00	.0000+00	.1001+03	.1319+05	.9664+02	.3361+03	.3948+03	.5105+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.8365+00	.4284+03	.4432+03	.1113+04	.2358+04	.2299+04	.1694+04	.1656+04	.1603+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3071+01	.1483+01	.1512+01	.1110+01	.1241+01	.1027+01	.2543+01	.1808+02	.1705+02
FS3CALC	P4CALC	P5.2	P7	PLS					PO
.1709+02	.1728+02	.3776+01	.3663+01	.8205+00					.8206+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4829+00	.4924+00	.1513+01	.1457+02	.9426+00	.4789+01	.9554+00	.3048+01	.4602+01	.4464+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2512+01	.3737+01	.2433+01	.3923+01	.6356+01	.6422+01	.4449+00	.3140+00	.5597+01	.2280+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.6356+01					.5707+01	.6021+01	.6466+01	.6466+01	.5911+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.1960-01	.1656-01	.1726-01	.0000+00	.5901+02	.7455+00	.9914+00	.8514+00	.8034+00	.9897+00
DH4-5/T4	VH3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7522-01	.6271+02	.5192+02	.1671+02	.6968+02	.2990-01	.4126+00	.2944+00	.5440+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2882+00	.1035+00	.2594+05	.2799+06	.9783-01	.8445-01	.8544+00	.7792+03	.4617+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
.5169+03	.1539+03	.3629+03	.1088+01	.5207+03	.9926+00	.1373+03	.1410+03	.3900+03	.8015+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.3626+01		.5195+03	.3616+03	.1092+01	.1427+05	.6957+02	.2020-01	.5058+04	.6120+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4298+04	.1177+01	.1046+03	.2141+03	.4471+02	.4338+02	.1303+04	.1938+04	.2751+03	.0000+00

ONLINE

CONFIDENTIAL

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1103 HRS 16 SEC CONFIGURATION 3.2 DATA PT. 6.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9850+00	.2695+04	.1941+04	.4325+04	.5210+04	.1205+01		.3544+03	.2791+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMM8	FNMM8	SFCMM8
.9966+00	.1031+01	-.2325-02	.1157+03	.7449-03			.5151+03	.3612+03	.1093+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	A2GEC
.5177+03	.3598+03	.1097+01	.6100+04	.4277+04	.1183+01	.4304+04	.1211+01	.0000+00	.7029+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1159+01	.1035+01	.2849+01	.9734+00	.1248+01	.1075-01	-.8423-02	.6638-03	-.9540-03	.2966-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.3143-02	-.1075-01	.4765-04	.3143-02	.1652+04	.1224+01				

ONLINE

CONFIDENTIAL

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1112 HRS 40 SEC CONFIGURATION 3.2 DATA PT. 9.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-10090.	.8006+00	.0000+00	.1002+03	.1319+05	.9664+02	.3383+03	.3954+03	.5106+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.8584+00	.4237+03	.4400+03	.1107+04	.2350+04	.2290+04	.1687+04	.1649+04	.1600+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3070+01	.1482+01	.1511+01	.1110+01	.1241+01	.1026+01	.2433+01	.1812+02	.1708+02
PS3CALC	P4CALC	P5.2	P7	PLS					PD
.1712+02	.1731+02	.3790+01	.3677+01	.8211+00					.8213+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4827+00	.4922+00	.1511+01	.1461+02	.9426+00	.4781+01	.9554+00	.3055+01	.4614+01	.4477+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2517+01	.3749+01	.2445+01	.3943+01	.6388+01	.6445+01	.4472+00	.3156+00	.5625+01	.2233+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.6388+01					.5735+01	.6051+01	.6498+01	.6498+01	.5941+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.1952-01	.1849-01	.1719-01	.0000+00	.4283+02	.7444+00	.9914+00	.8619+00	.8031+00	.9912+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7519-01	.6257+02	.5187+02	.1672+02	.6962+02	.2989-01	.4133+00	.2945+00	.5433+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2883+00	.1045+00	.2613+05	.2820+06	.9845-01	.8442-01	.8482+00	.7753+03	.4593+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.5187+03	.1539+03	.3648+03	.1084+01	.5225+03	.9928+00	.1372+03	.1410+03	.3900+03	.8217+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.3639+01		.5187+03	.3649+03	.1084+01	.1432+05	.6969+02	.2027-01	.5085+04	.6245+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPKT
.4322+04	.1177+01	.1049+03	.2147+03	.4490+02	.4355+02	.1305+04	.1944+04	.2757+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1112 HRS 40 SEC CONFIGURATION 3,2 DATA PT. 9.0

EFFBURNGE	T4CGE	T5,10GE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9850+00	.2704+04	.1948+04	.4350+04	.5245+04	.1206+01		.3555+03	.2801+03	
FJMM8/FJS	T8/T5.5	DPLS	PEA8H	POST8			FJMM8	FNMM8	SFCMM8
.9968+00	.1028+01	-.3411-02	.1158+03	.2020-02			.5171+03	.3631+03	.1089+01
FJMM8D	FNMM8D	SFCMM8D	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.5170+03	.3632+03	.1089+01	.6125+04	.4302+04	.1182+01	.4330+04	.1211+01	.0000+00	.7031+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1197+01	.1033+01	.2889+01	.9726+00	.1248+01	.1412-01	-.1016-01	.6124-03	-.7082-03	.2070-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1819-02	-.1412-01	-.4223-03	.3078-03	.1645+04	.1224+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TI..E 1124 HRS 6 SEC CONFIGURATION 3.2 DATA PT. 10.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-10190.	.7954+00	.0000+00	.1234+03	.1339+05	.9813+02	.3556+03	.4154+03	.5103+02	.1061+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.1439+01	.4254+03	.4393+03	.1119+04	.2413+04	.2351+04	.1740+04	.1700+04	.1651+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3084+01	.1490+01	.1519+01	.1108+01	.1240+01	.1024+01	.2651+01	.1853+02	.1747+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1758+02	.1773+02	.3909+01	.3792+01	.8205+00					.8209+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4832+00	.4926+00	.1511+01	.1494+02	.9426+00	.4741+01	.9566+00	.3152+01	.4762+01	.4620+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2547+01	.3870+01	.2451+01	.3953+01	.6405+01	.6469+01	.4483+00	.3164+00	.5640+01	.2184+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.6405+01					.5755+01	.6072+01	.6520+01	.6520+01	.5956+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2046-01	.1937-01	.1801-01	.0000+00	.4810+02	.7383+00	.9921+00	.8573+00	.7978+00	.9901+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7455-01	.6199+02	.5411+02	.1661+02	.6878+02	.2990-01	.4143+00	.2945+00	.5346+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2838+00	.1046+00	.2582+05	.2778+06	.9791-01	.8438-01	.8470+00	.7748+03	.4590+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.5364+03	.1542+03	.3822+03	.1087+01	.5362+03	.1000+01	.1356+03	.1411+03	.3900+03	.8255+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.3760+01		.5358+03	.3825+03	.1086+01	.1455+05	.6986+02	.2127-01	.5349+04	.6357+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSHT/WPRT
.4529+04	.1181+01	.1066+03	.2196+03	.4633+02	.4494+02	.1321+04	.2007+04	.2762+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1124 HRS 6 SEC CONFIGURATION 3.2 DATA PT. 10.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PS8A8	
.9850+00	.2781+04	.2011+04	.4559+04	.5519+04	.1210+01		.3620+03	.2894+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.9932+00	.1027+01	-.2015-02	.1159+03	-.5827-03			.5328+03	.3785+03	.1097+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.5322+03	.3789+03	.1096+01	.6314+04	.4486+04	.1192+01	.4516+04	.1222+01	.0000+00	.7055+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1157+01	.1031+01	.2987+01	.9609+00	.1247+01	.1221-01	-.8574-02	.1001-02	-.6463-03	.6312-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.4078-02	-.1221-01	.3716-04	.7048-03	.1696+04	.1219+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1150 HRS 0 SEC CONFIGURATION 3.2 DATA PT. 11.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-10110.	.7987+00	.0000+00	.1234+03	.1339+05	.9811+02	.3528+03	.4144+03	.5105+02	.1861+05
WCW	TT1D	T2	T3	T3,9CALC	T4CALC	T5,0CALC	T5,1CALC	T5,5AVG	
-.1562+01	.4239+03	.4597+03	.1118+04	.2407+04	.2346+04	.1735+04	.1698+04	.1640+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3084+01	.1489+01	.1517+01	.1107+01	.1240+01	.1023+01	.2649+01	.1845+02	.1739+02
PS3CALC	P4CALC	P5,2	P7	PLS					PO
.1745+02	.1764+02	.3886+01	.3770+01	.8181+00					.8186+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5,2	P4/P3GE	P5,2/P2	P5,2/PO	P7/PO
.4827+00	.4919+00	.1514+01	.1488+02	.9426+00	.4747+01	.9561+00	.3135+01	.4747+01	.4605+01
T3/T2	T5,1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3,1	PS8/P7
.2543+01	.3857+01	.2456+01	.3960+01	.6415+01	.6468+01	.4491+00	.3169+00	.5649+01	.2170+00
WA5,1					WG3,9	WG4	WG5,1	WG8	WA4
.6415+01					.5764+01	.6081+01	.6530+01	.6530+01	.5966+01
FE3,9	FE4	FE5,1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2037-01	.1929-01	.1794-01	.0000+00	.5430+02	.7384+00	.9913+00	.8579+00	.7982+00	.9919+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5,2	TPL5,2	M1	M3	M5,2	
.7463-01	.6235+02	.5552+02	.1670+02	.6921+02	.2990-01	.4171+00	.2945+00	.5394+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2857+00	.1045+00	.2590+05	.2787+06	.9767-01	.8435-01	.8477+00	.7771+03	.4605+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.5345+03	.1550+03	.3796+03	.1092+01	.5360+03	.9972+00	.1365+03	.1411+03	.3900+03	.8225+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5,1C	WFEC	FJSC
.3738+01		.5540+03	.3798+03	.1091+01	.1454+05	.7003+02	.2116-01	.5336+04	.6337+04
FNSC	SFCC	PCNC	P3C	P5,2C	P7C	T3C	T5,1C	N/RT4	WSRT/WPRT
.4500+04	.1186+01	.1066+03	.2187+03	.4607+02	.4469+02	.1319+04	.2001+04	.2765+03	.0000+00

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1130 HRS 0 SEC CONFIGURATION 3.2 DATA PT. 11.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9850+00	.2771+04	.2004+04	.4530+04	.5504+04	.1215+01		.3621+03	.2877+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9943+00	.1031+01	-.4031-02	.1155+03	.1043-03			.5315+03	.3765+03	.1101+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.5310+03	.3768+03	.1100+01	.6301+04	.4464+04	.1195+01	.4494+04	.1225+01	.0000+00	.7060+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1156+01	.1030+01	.2959+01	.9670+00	.1248+01	.1107-01	-.8855-02	.6335-03	-.4873-03	.2580-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.2873-02	-.1107-01	.2680-03	.2873-02	.1692+04	.1222+01				

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DATE: 5/23/68
GROUP 1:
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 11 8 HRS 21 SEC CONFIGURATION 3.2 DATA PT. 12.

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	HL
-10300.	.7898+00	.0000+00	.1234+03	.1338+05	.9803+02	.3471+03	.4084+03	.5105+02	.1861+05
WCH	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.1176+01	.4844+03	.4386+03	.1116+04	.2387+04	.2326+04	.1715+04	.1677+04	.1629+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3090+01	.1492+01	.1521+01	.1108+01	.1240+01	.1023+01	.2299+01	.1847+02	.1741+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1787+02	.1766+02	.3846+01	.3731+01	.8214+00					.8216+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4827+00	.4924+00	.1509+01	.1490+02	.9426+00	.4801+01	.9562+00	.3102+01	.4680+01	.4540+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2544+01	.3824+01	.2459+01	.3965+01	.6424+01	.6482+01	.4497+00	.3173+00	.5657+01	.2201+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.6424+01					.5770+01	.6088+01	.6537+01	.6537+01	.5974+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2005-01	.1899-01	.1766-01	.0000+00	.5057+02	.7384+00	.9913+00	.8586+00	.7985+00	.9911+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7513-01	.6224+02	.5356+02	.1663+02	.6961+02	.2989-01	.4154+00	.2945+00	.5436+00	
	M3EFF	RN12	RN4	RN8	RN14GE	DELTA2	THETA2	VO	VOK
	.2854+00	.1048+00	.2605+05	.2808+06	.9869-01	.8439-01	.8456+00	.7729+03	.4579+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	PUC
.5277+03	.1543+03	.3734+03	.1094+01	.5319+03	.9921+00	.1372+03	.1411+03	.3900+03	.8298+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.3700+01		.5266+03	.3740+03	.1092+01	.1455+05	.7003+02	.2088-01	.5264+04	.6256+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4425+04	.1189+01	.1066+03	.2189+03	.4560+02	.4423+02	.1320+04	.1984+04	.2775+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1138 HRS 21 SEC CONFIGURATION 3.2 DATA PT. 12.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PS8A8	
.9850+00	.2755+04	.1987+04	.4456+04	.5433+04	.1219+01		.3606+03	.2846+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.9976+00	.1027+01	-.1137-02	.1160+03	.1809-02			.5264+03	.3721+03	.1097+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.5253+03	.3727+03	.1096+01	.6241+04	.4411+04	.1193+01	.4441+04	.1223+01	.0000+00	.7066+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1155+01	.1030+01	.2910+01	.9724+00	.1248+01	.1144-01	-.7735-02	.1157-02	-.8214-03	.5019-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.3526-02	-.1144-01	-.1157-02	.2138-02	.1673+04	.1223+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1146 HRS 52 SEC CONFIGURATION 3.2 DATA PT. 13.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-10240.	.7935+00	.0000+00	.1234+03	.1338+05	.9804+02	.3467+03	.4085+03	.5106+02	.1061+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1012+01	.4252+03	.4391+03	.1115+04	.2388+04	.2327+04	.1717+04	.1679+04	.1631+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3089+01	.1492+01	.1521+01	.1109+01	.1241+01	.1024+01	.2376+01	.1839+02	.1733+02
PS3CALC	P4CALC	P5.2	P7	PLS					P0
.1739+02	.1758+02	.3844+01	.3729+01	.8210+00					.8208+00
PSINA/P00	PSINB/P00	P2/P0	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/P0	P7/P0
.4828+00	.4922+00	.1512+01	.1462+02	.9426+00	.4783+01	.9559+00	.3098+01	.4683+01	.4543+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2540+01	.3825+01	.2456+01	.3961+01	.6417+01	.6479+01	.4492+00	.3170+00	.5651+01	.2202+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.6417+01					.5764+01	.6081+01	.6531+01	.6531+01	.5968+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2008-01	.1901-01	.1768-01	.0000+00	.4240+02	.7385+00	.9913+00	.8585+00	.7985+00	.9904+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7496-01	.6239+02	.5316+02	.1669+02	.6962+02	.2989-01	.4162+00	.2945+00	.5437+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	V0	V0K
	.2863+00	.1048+00	.2602+05	.2803+06	.9819-01	.8442-01	.8465+00	.7751+03	.4593+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	PUD
.5280+03	.1546+03	.3734+03	.1094+01	.5318+03	.9929+00	.1372+03	.1411+03	.3900+03	.8275+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.3594+01		.5271+03	.3739+03	.1093+01	.1454+05	.6993+02	.2089-01	.5259+04	.6254+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4423+04	.1189+01	.1066+03	.2178+03	.4553+02	.4417+02	.1317+04	.1984+04	.2774+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1146 HRS 52 SEC CONFIGURATION 3.2 DATA PT. 13.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE			MBV8	PS8A8
.9850+00	.2754+04	.1987+04	.4452+04	.5427+04	.1219+01			.3604+03	.2844+03
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POST8			FJMMB	FNMMB	SFCMMB
.9967+00	.1027+01	-.2894-02	.1158+03	-.4367-03			.5263+03	.3717+03	.1099+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.5253+03	.3722+03	.1098+01	.6233+04	.4402+04	.1195+01	.4432+04	.1225+01	.0000+00	.7061+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1157+01	.1031+01	.2903+01	.9727+00	.1249+01	.1154-01	-.7842-02	.6611-03	-.5133-03	.2992-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.2748-02	-.1154-01	-.6611-03	.6273-03	.1675+04	.1224+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1154 HRS 35 SEC CONFIGURATION 3.2 DATA PT. 14.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-10070.	.8024+00	.0000+00	.1234+03	.1339+05	.9808+02	.3359+03	.4112+03	.5106+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.9351+00	.4251+03	.4402+03	.1118+04	.2396+04	.2335+04	.1723+04	.1686+04	.1637+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.3093+01	.1493+01	.1521+01	.1109+01	.1242+01	.1025+01	.2492+01	.1840+02	.1735+02
PS3CALC	P4CALC	P5.2	P7	PLS					P0
.1740+02	.1759+02	.3857+01	.3741+01	.8185+00					.6182-00
PSINA/P00	PSINB/P00	P2/P0	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/P0	P7/P0
.4827+00	.4917+00	.1518+01	.1482+02	.9426+00	.4771+01	.9557+00	.3106+01	.4713+01	.4572+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2539+01	.3830+01	.2460+01	.3966+01	.6426+01	.6473+01	.4498+00	.3174+00	.5659+01	.2188+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.6426+01					.5773+01	.6090+01	.6540+01	.6540+01	.5976+01
FE3.9	FE4	FE5.1	WPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2018-01	.1911-01	.1777-01	.0000+00	.4894+02	.7387+00	.9913+00	.8587+00	.7987+00	.9927+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7487-01	.6257+02	.5317+02	.1673+02	.6963+02	.2989-01	.4156+00	.2945+00	.5439+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	V0	V0K
	.2869+00	.1045+00	.2601+05	.2801+06	.9789-01	.8449-01	.8486+00	.7794+03	.4618+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.5182+03	.1557+03	.3626+03	.1134+01	.5343+03	.9699+00	.1373+03	.1411+03	.3900+03	.8209+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.3711+01		.5179+03	.3628+03	.1133+01	.1453+05	.7006+02	.2094-01	.5283+04	.6134+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSR1/WPRT
.4291+04	.1231+01	.1065+03	.2178+03	.4565+02	.4428+02	.1317+04	.1987+04	.2771+03	.0000+00

ONLINE

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1154 HRS 35 SEC CONFIGURATION 3.2 DATA PT. 14.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9850+00	.2756+04	.1990+04	.4320+04	.5448+04	.1261+01		.3616+03	.2854+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.1020+01	.1027+01	-.3359-02	.1155+03	-.6688-04			.5288+03	.3731+03	.1102+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.5284+03	.3733+03	.1101+01	.6259+04	.4416+04	.1196+01	.4446+04	.1226+01	.0000+00	.7056+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.1156+01	.1032+01	.2918+01	.9728+00	.1249+01	.1222-01	-.8615-02	.6795-03	-.5924-03	.2006-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.2398-02	-.1222-01	.4851-03	.1766-02	.1682+04	.1200+01				

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1329 HRS 18 SEC CONFIGURATION 3.2 DATA PT. 19.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N- 602.	.7943+00	.0000+00	.1234+03	.1346+05	.9858+02	.2333+03	.2934+03	.5101+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1143+01	.4233+03	.4443+03	.1151+04	.2546+04	.2480+04	.1853+04	.1808+04	.1761+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1951+01	.9457+00	.9621+00	.7164+00	.7991+00	.6654+00	.2853+01	.1199+02	.1141+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1136+02	.1148+02	.2538+01	.2461+01	.5201+00					.5204+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4847+00	.4931+00	.1536+01	.1501+02	.9517+00	.4725+01	.9571+00	.3176+01	.4877+01	.4730+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2590+01	.4069+01	.1554+01	.2505+01	.4059+01	.4079+01	.2841+00	.2005+00	.3575+01	.2113+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.4059+01					.3656+01	.3857+01	.4141+01	.4141+01	.3775+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2280-01	.2159-01	.2008-01	.0000+00	.7479+02	.7187+00	.9738+00	.8440+00	.7814+00	.9952+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7344-01	.6244+02	.3544+02	.1673+02	.6937+02	.3028-01	.4075+00	.2694+00	.5425+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2817+00	.6642-01	.1591+05	.1702+06	.5979-01	.5437-01	.8566+00	.7931+03	.4699+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
.3519+03	.1001+03	.2519+03	.1165+01	.3529+03	.9973+00	.1369+03	.1412+03	.3946+03	.5325+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2463+01		.3503+03	.2527+03	.1161+01	.1454+05	.6910+02	.2344-01	.5831+04	.6473+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4632+04	.1259+01	.1065+03	.2206+03	.4668+02	.4527+02	.1343+04	.2111+04	.2702+03	.0000+00

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1329 HRS 18 SEC CONFIGURATION 3.2 DATA PT. 19.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBVB	PSBAB	
.9674+00	.2899+04	.2114+04	.4661+04	.6003+04	.1288+01		.2367+03	.1683+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.9913+00	.1022+01	.2085-01	.7350+02	.2722-02			.3489+03	.2486+03	.1179+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.3472+03	.2497+03	.1175+01	.6417+04	.4576+04	.1274+01	.4604+04	.1304+01	.0000+00	.6944+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPS(+)
.6950+00	.6710+00	.1933+01	.9695+00	.8032+00	.9677-02	-.8064-02	.7570-03	-.1075-02	.4936-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.4224-02	-.9677-02	.4759-03	.1471-02	.1800+04	.1224+01				

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AEDC-TR-68-244

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1340 HRS 52 SEC CONFIGURATION 3.2 DATA PT. 20.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	ML
N-350.	.7944+00	.0000+00	.1234+03	.1346+05	.9864+02	.2267+03	.2851+03	.5102+02	.1061+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.1340+01	.4261+03	.4448+03	.1155+04	.2554+04	.2487+04	.1857+04	.1812+04	.1764+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1893+01	.9154+00	.9320+00	.6948+00	.7742+00	.6461+00	.2708+01	.1168+02	.1113+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1107+02	.1118+02	.2449+01	.2375+01	.5183+00					.5181+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4835+00	.4923+00	.1494+01	.1508+02	.9530+00	.4767+01	.9575+00	.3164+01	.4727+01	.4584+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2596+01	.4075+01	.1503+01	.2423+01	.3926+01	.3933+01	.2748+00	.1939+00	.3457+01	.2182+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3926+01					.3536+01	.3730+01	.4005+01	.4005+01	.3651+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2291-01	.2169-01	.2017-01	.0000+00	.7397+02	.7173+00	.9724+00	.8416+00	.7795+00	.9983+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7361-01	.6225+02	.3581+02	.1664+02	.6961+02	.3031-01	.4040+00	.2657+00	.5454+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2802+00	.6427-01	.1536+05	.1644+06	.5804-01	.5268-01	.8575+00	.7699+03	.4562+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
.3368+03	.9395+02	.2429+03	.1174+01	.3395+03	.9920+00	.1374+03	.1412+03	.3949+03	.5158+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2369+01		.3371+03	.2427+03	.1175+01	.1454+05	.6902+02	.2353-01	.5846+04	.6394+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPXT
.4610+04	.1268+01	.1065+03	.2217+03	.4650+02	.4509+02	.1347+04	.2114+04	.2700+03	.0000+00

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

1-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1340 HRS 52 SEC CONFIGURATION 3.2 DATA PT. 20.0

EFFBURNGE .9661+00	T4CGE .2905+04	T5.1CGE .2117+04	FNSCGE .4639+04	WFECGE .6017+04	SFCCGE .1297+01		M8V8 .2292+03	PS8A8 .1817+03	
FJMMB/FJS .9950+00	T8/T5.5 .1023+01	DPLS .1744-01	PEA8H .7318+02	POSTB .4857-03			FJMMB .3351+03	FNMMB .2412+03	SFCMMB .1182+01
FJMMBD .3354+03	FNMMBD .2410+03	SFCMMBD .1183+01	FJMMBC .6362+04	FNMMBC .4579+04	SFCMMBC .1277+01	FNMMBCGE .4607+04	SFCMMBCGE .1306+01	WHF .0000+00	WA2GEC .6913+02
PSLS .6727+00	PS2W .6510+00	PS7 .1848+01	CD .9730+00	P2P .7775+00	D-DPOO(+) .1181-01	D-DPOO(-) -.8314-02	D-DPOO-I(+) .7228-03	D-DPOO-I(-) -.1392-02	D-DPO(+) .3754-02
D-DPO(-) -.4000-02	DPOO AV -.1181-01	DPOO IAV .1392-02	DPO AV .4000-02	T8 .1805+04	CFJSV .1222+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1353 HRS 17 SEC CONFIGURATION 3.2 DATA PT. 21.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-600.	.7843+00	.0000+00	.1234+03	.1346+05	.9862+02	.2211+03	.2873+03	.5105+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1055+01	.4248+03	.4434+03	.1149+04	.2549+04	.2483+04	.1857+04	.1811+04	.1765+04	
	PUO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1902+01	.9199+00	.9360+00	.6963+00	.7757+00	.6463+00	.2425+01	.1162+02	.1108+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1101+02	.1112+02	.2458+01	.2383+01	.5200+00					.5197+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4838+00	.4922+00	.1493+01	.1499+02	.9527+00	.4730+01	.9568+00	.3168+01	.4729+01	.4586+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	P68/P7
.2592+01	.4085+01	.1512+01	.2438+01	.3949+01	.3960+01	.2764+00	.1951+00	.3478+01	.2182+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3949+01					.3558+01	.3753+01	.4029+01	.4029+01	.3673+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2295-01	.2173-01	.2021-01	.0000+00	.5286+02	.7171+00	.9709+00	.8419+00	.7795+00	.9972+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7329-01	.6259+02	.3527+02	.1681+02	.6977+02	.3031-01	.4039+00	.2664+00	.5471+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2826+00	.6467-01	.1547+05	.1654+06	.5787-01	.5278-01	.8547+00	.7678+03	.4549+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	A8HOT	TOD	POD
.3313+03	.9425+02	.2370+03	.1212+01	.3415+03	.9701+00	.1377+03	.1413+03	.3948+03	.5221+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2383+01		.3309+03	.2372+03	.1211+01	.1456+05	.6918+02	.2364-01	.5888+04	.6275+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4490+04	.1311+01	.1067+03	.2202+03	.4657+02	.4516+02	.1345+04	.2119+04	.2702+03	.0000+00

ONLINE

P8 RAKE IN THRUST VOID

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1353 HRS 17 SEC CONFIGURATION 3.2 DATA PT. 21.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9646+00	.2909+04	.2122+04	.4519+04	.6064+04	.1342+01		.2305+03	.1824+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.1017+01	.1022+01	.3130-01	.7341+02	.6237-03			.3366+03	.2426+03	.1184+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.3365+03	.2428+03	.1184+01	.6382+04	.4596+04	.1281+01	.4625+04	.1311+01	.0000+00	.6737+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.6344+00	.6527+00	.1859+01	.9750+00	.7791+00	.1108-01	-.8044-02	.4916-03	-.3515-03	.2362-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.2130-02	-.1108-01	-.3350-04	.8356-03	.1804+04	.1202+01				

ONLINE

DATE: 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1405 HRS 27 SEC CONFIGURATION 3.2 DATA PT. 22.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	ML
N-100.	.8086+00	.0000+00	.1034+03	.1330+05	.9745+02	.2135+03	.2768+03	.5109+02	.1861+05
WCH	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1165+01	.4307+03	.4467+03	.1143+04	.2513+04	.2448+04	.1829+04	.1785+04	.1742+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1883+01	.9116+00	.9280+00	.6973+00	.7757+00	.6490+00	.2360+01	.1131+02	.1078+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1070+02	.1081+02	.2410+01	.2337+01	.5201+00					.5203+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4840+00	.4927+00	.1491+01	.1458+02	.9531+00	.4694+01	.9561+00	.3107+01	.4632+01	.4492+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2558+01	.3995+01	.1487+01	.2398+01	.3885+01	.3912+01	.2720+00	.1919+00	.3421+01	.2228+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3885+01					.3498+01	.3690+01	.3962+01	.3962+01	.3613+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2248-01	.2128-01	.1979-01	.0000+00	.5273+02	.7224+00	.9675+00	.8464+00	.7844+00	.9932+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7330-01	.6292+02	.3397+02	.1688+02	.6946+02	.3031-01	.4022+00	.2652+00	.5433+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2851+00	.6403-01	.1534+05	.1641+06	.5714-01	.5278-01	.8612+00	.7697+03	.4560+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.3229+03	.9295+02	.2300+03	.1204+01	.3318+03	.9732+00	.1371+03	.1412+03	.3951+03	.5096+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2333+01		.3243+03	.2292+03	.1208+01	.1433+05	.6832+02	.2298-01	.5652+04	.6118+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4357+04	.1297+01	.1050+03	.2143+03	.4566+02	.4428+02	.1327+04	.2072+04	.2689+03	.0000+00

ONLINE

P8 RAKE IN THRUST VOID

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

J-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1405 HRS 27 SEC CONFIGURATION 3.2 DATA PT. 22.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9612+00	.2847+04	.2075+04	.4383+04	.5813+04	.1326+01		.2250+03	.1787+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.1015+01	.1020+01	.6260-02	.7347+02	-.2474-03			.3277+03	.2348+03	.1179+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.3292+03	.2340+03	.1183+01	.6209+04	.4448+04	.1271+01	.4475+04	.1299+01	.0000+00	.6876+02
PSLS	PS2W	PS7	CD	P2P	D-DPO0(+)	D-DPO0(-)	D-DPO0-I(+)	D-DPO0-I(-)	D-DPO(+)
.7055+00	.6557+00	.1822+01	.9707+00	.7795+00	.1026-01	-.8746-02	.6146-03	-.6330-03	.3901-02
D-DPO(-)	DPOG AV	DPO0 IAV	DPO AV	T8		CFJSV			
-.3795-02	-.1026-01	-.4440-04	-.3450-02	.1777+04	.1201+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1413 HRS 25 SEC CONFIGURATION 3.2 DATA PT. 23.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-370.	.7958+00	.0000+00	.1035+03	.1329+05	.9738+02	.2192+03	.2770+03	.5113+02	.1061+05
WCH	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1045+01	.4268+03	.4449+03	.1142+04	.2511+04	.2445+04	.1825+04	.1781+04	.1734+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1881+01	.9097+00	.9271+00	.6976+00	.7759+00	.6483+00	.2585+01	.1142+02	.1089+02
PS3CALC	P4CALC	P5.2	P7	PLS					PC
.1082+02	.1093+02	.2415+01	.2341+01	.5129+00					.5131+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4836+00	.4928+00	.1512+01	.1472+02	.9529+00	.4731+01	.9568+00	.3112+01	.4706+01	.4564+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2567+01	.4003+01	.1492+01	.2406+01	.3898+01	.3931+01	.2729+00	.1926+00	.3433+01	.2190+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3898+01					.3509+01	.3702+01	.3975+01	.3975+01	.3625+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2242-01	.2123-01	.1974-01	.0000+00	.4868+02	.7221+00	.9682+00	.8447+00	.7834+00	.9916+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7350-01	.6247+02	.3453+02	.1675+02	.6947+02	.3031-01	.4025+00	.2659+00	.5434+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VJK
	.2830+00	.6438-01	.1539+05	.1648+06	.5782-01	.5279-01	.8578+00	.7806+03	.4625+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHJT	TOD	PJC
.3313+03	.9457+02	.2367+03	.1170+01	.3336+03	.9929+00	.1371+03	.1412+03	.3949+03	.5163+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2331+01		.3308+03	.2369+03	.1169+01	.1435+05	.6638+02	.2302-01	.5666+04	.6275+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSHT/WPHT
.4484+04	.1264+01	.1051+03	.2164+03	.4574+02	.4435+02	.1331+04	.2076+04	.2688+03	.0000+00

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1413 HRS 25 SEC CONFIGURATION 3.2 DATA PT. 23.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PS8A8	
.9618+00	.2855+04	.2080+04	.4511+04	.5832+04	.1293+01		.2255+03	.1790+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9948+00	.1023+01	.6881-02	.7244+02	-.2677-03			.3296+03	.2350+03	.1179+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.3291+03	.2352+03	.1178+01	.6243+04	.4451+04	.1273+01	.4479+04	.1302+01	.0000+00	.6696+02
PSLS	PS2H	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.7029+00	.6549+00	.1819+01	.9709+00	.7800+00	.5425-02	-.5280-02	.6443-03	-.4619-03	.2293-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.2733-02	-.5425-02	.3985-03	.2733-02	.1774+04	.1221+01				

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1418 HRS 58 SEC CONFIGURATION 3.2 DATA PT. 24.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N-490.	.7896+00	.0000+00	.1042+03	.1331+05	.9752+02	.2205+03	.2794+03	.5112+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1023+01	.4250+03	.4441+03	.1142+04	.2516+04	.2450+04	.1829+04	.1785+04	.1735+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1886+01	.9121+00	.9298+00	.6973+00	.7754+00	.6477+00	.2758+01	.1147+02	.1092+02
PS3CALC	P4CALC	P5.2	P7	PLS					PD
.1085+02	.1097+02	.2422+01	.2348+01	.5136+00					.5136+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4836+00	.4929+00	.1510+01	.1479+02	.9528+00	.4734+01	.9566+00	.3123+01	.4715+01	.4572+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2572+01	.4020+01	.1499+01	.2418+01	.3917+01	.3935+01	.2742+00	.1935+00	.3449+01	.2187+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3917+01					.3527+01	.3720+01	.3995+01	.3995+01	.3643+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2250-01	.2131-01	.1982-01	.0000+00	.4228+02	.7213+00	.9685+00	.8438+00	.7825+00	.9953+00
DH4-5/T4	VH3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7345-01	.6256+02	.3460+02	.1679+02	.6970+02	.3031-01	.4004+00	.2661+00	.5460+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2834+00	.6450-01	.1545+05	.1654+06	.5789-01	.5276-01	.8561+00	.7784+03	.4612+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.3322+03	.9477+02	.2374+03	.1177+01	.3358+03	.9891+00	.1375+03	.1412+03	.3949+03	.5192+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2340+01		.3514+03	.2378+03	.1175+01	.1439+05	.6869+02	.2315-01	.5724+04	.6295+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4500+04	.1272+01	.1054+03	.2173+03	.4590+02	.4451+02	.1334+04	.2085+04	.2689+03	.0000+00

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ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1418 HRS 58 SEC CONFIGURATION 3.2 DATA PT. 24.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBVB	PS8A8	
.9622+00	.2866+04	.2089+04	.4528+04	.5894+04	.1302+01		.2269+03	.1796+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMM8	SFCMMB
.9976+00	.1024+01	.7399-02	.7251+02	.5816-03			.3514+03	.2366+03	.1161+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.3306+03	.2370+03	.1179+01	.6281+04	.4485+04	.1276+01	.4512+04	.1306+01	.0000+00	.6901+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.7026+00	.6542+00	.1823+01	.9741+00	.7787+00	.8832-02	-.6919-02	.6286-03	-.9161-03	.1801-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1561-02	-.8832-02	.6335-04	.1169-02	.1778+04	.1221+01				

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

J-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1429 HRS 18 SEC CONFIGURATION 3.2 DATA PT. 25.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FB	WFB	SA	WL
N-390.	.7963+00	.0000+00	.9695+02	.1306+05	.9569+02	.2091+03	.2631+03	.5113+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.3110+00	.4273+03	.4450+03	.1125+04	.2441+04	.2378+04	.1769+04	.1728+04	.1693+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1860+01	.9000+00	.9162+00	.7010+00	.7771+00	.6536+00	.2395+01	.1111+02	.1059+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1051+02	.1062+02	.2352+01	.2280+01	.5127+00					.5127+00
PSINA/P00	PSINB/P00	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4839+00	.4926+00	.1516+01	.1430+02	.9529+00	.4724+01	.9560+00	.3026+01	.4587+01	.4448+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2529+01	.3883+01	.1474+01	.2377+01	.3851+01	.3884+01	.2696+00	.1903+00	.3392+01	.2288+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3851+01					.3465+01	.3655+01	.3924+01	.3924+01	.3582+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2155-01	.2041-01	.1898-01	.0000+00	.2635+02	.7293+00	.9621+00	.8493+00	.7893+00	.9915+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7374-01	.6253+02	.3304+02	.1678+02	.6937+02	.3030-01	.3949+00	.2660+00	.5417+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2856+00	.6447-01	.1544+05	.1658+06	.5793-01	.5287-01	.8579+00	.7827+03	.4637+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.3208+03	.9569+02	.2271+03	.1159+01	.3225+03	.9946+00	.1368+03	.1411+03	.3949+03	.5168+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2273+01		.3202+03	.2274+03	.1157+01	.1410+05	.6747+02	.2212-01	.5373+04	.6067+03
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4295+04	.1251+01	.1033+03	.2101+03	.4447+02	.4313+02	.1312+04	.2014+04	.2679+03	.0300+00

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ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1429 HRS 18 SEC CONFIGURATION 3.2 DATA PT. 25.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9558+00	.2776+04	.2017+04	.4322+04	.5530+04	.1280+01		.2194+03	.1741+03	
FJMM8/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMM8	FNMM8	SFCMM8
.9935+00	.1016+01	.7968-02	.7234+02	.5639-03			.3187+03	.2250+03	.1169+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.3181+03	.2253+03	.1168+01	.6028+04	.4256+04	.1263+01	.4282+04	.1292+01	.0000+00	.6604+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.7049+00	.6600+00	.1773+01	.9694+00	.7805+00	.9323-02	-.8754-02	.9183-03	-.9968-03	.1859-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1767-02	-.9323-02	.9968-03	.1562-03	.1720+04	.1222+01				

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ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1437 HRS 20 SEC CONFIGURATION 3,2 DATA PT. 26.0

(ALT)D N- 500.	(MO)D .7929+00	DTO .0000+00	PLA .9722+02	N .1307+05	PCN .9573+02	FS .2103+03	WFE .2653+03	SA .5116+02	TL .1861+05
WCW .1176+01	TT1D .4267+03	T2 .4445+03	T3 .1126+04	T3.9CALC .2450+04	T4CALC .2386+04	T5.0CALC .1777+04	T5.1CALC .1735+04	T5.5AVG .1698+04	
	POO .1862+01	PSINA .9023+00	PSINB .9185+00	PSI .7037+00	P2 .7786+00	PS2 .6543+00	P2DIST .2797+01	P3X .1118+02	PS3 .1065+02
PS3CALC .1058+02	P4CALC .1070+02	P5.2 .2357+01	P7 .2286+01	PLS .5135+00					PC .5134+00
PSINA/POO .4846+00	PSINB/POO .4933+00	P2/PO .1517+01	P3/P2 .1436+02	PS3/P3 .9527+00	P3/P5.2 .4744+01	P4/P3GE .9564+00	P5.2/P2 .3027+01	P5.2/PO .4591+01	P7/PO .4452+01
T3/T2 .2533+01	T5.1CALC/T2 .3904+01	WAINA .1477+01	WAINB .2382+01	WAIN .3859+01	WA2GE .3901+01	WC3 .2701+00	WC4 .1906+00	WA3.1 .3398+01	PS8/P7 .2246+00
WA5.1 .3859+01					WG3.9 .3472+01	WG4 .3662+01	WG5.1 .3933+01	WG8 .3933+01	WA4 .3589+01
FE3.9 .2168-01	FE4 .2053-01	FE5.1 .1909-01	HPE .0000+00	QSW .2850+02	EFFCOMP .7290+00	EFFBURN .9628+00	EFFTURB .8453+00	EFFROTOR .7872+00	WAIN/WA2GE .9891+00
DH4-5/T4 .7360-01	VR3 .6228+02	CIP .3340+02	WRT/P4CALC .1673+02	WRT/P5.2 .6950+02	TPL5.2 .3031-01	M1 .3924+00	M3 .2664+00	M5.2 .5432+00	
	M3EFF .2843+00	RNI2 .6469-01	RN4 .1544+05	RN8 .1657+06	RNI4GE .5812-01	DELTA2 .5298-01	THETA2 .8569+00	VO .7826+03	VJK .4636+03
FJS .3225+03	FR .9388+02	FNS .2286+03	SFC .1160+01	FJCN .3240+03	CFJCN .9953+00	ABEFF .1371+03	ABHOT .1411+03	TOD .3948+03	POD .5196+00
P7X .2281+01		FJSD .3216+03	FNSD .2290+03	SFCD .1158-01	NC2 .1412+05	WAINC .6743+02	FE5.1C .2228-01	WFEC .5409+04	FJSC .6087+02
FNSC .4315+04	SFCC .1254+01	PCNC .1034+03	P3C .2111+03	P5.2C .4449+02	P7C .4314+02	T3C .1314+04	T5.1C .2025+04	N/RT4 .2675+03	WSRT/WPRT .0000+00

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GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1437 HRS 20 SEC CONFIGURATION 3.2 DATA PT. 26.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBVB	PSBAB	
.9566+00	.2789+04	.2028+04	.4342+04	.5568+04	.1282+01		.2203+03	.1745+03	
FJMMB/FJS	T8 [illegible].5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.9921+00	.101[illegible]1	.7450-02	.7245+02	-.3617-03			.3199+03	.2261+03	.1173+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.3191+03	.2265+03	.1171+01	.6039+04	.4267+04	.1268+01	.4293+04	.1297+01	.0000+00	.6817+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.7088+00	.6593+00	.1779+01	.9713+00	.7825+00	.1162-01	-.9906-02	.7911-03	-.7635-03	.2939-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1295-02	-.1162-01	-.2794-03	-.2939-02	.1728+04	.1224+01				

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GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL: RD0820-11 RUN DATE 05-23-68 TIME 1447 HRS 9 SEC CONFIGURATION 3.2 DATA PT. 27.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N- 480.	.7976+00	.0000+00	.9705+02	.1307+05	.9573+02	.2055+03	.2653+03	.5117+02	.1861+05
WCH	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.1307+01	.4278+03	.4451+03	.1126+04	.2449+04	.2385+04	.1776+04	.1734+04	.1700+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1887+01	.9057+00	.9213+00	.7046+00	.7810+00	.6568+00	.2832+01	.1119+02	.1066+02
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.1059+02	.1070+02	.2370+01	.2298+01	.5229+00					.5229+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4850+00	.4933+00	.1494+01	.1433+02	.9527+00	.4722+01	.9563+00	.3034+01	.4532+01	.4395+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2530+01	.3897+01	.1480+01	.2386+01	.3865+01	.3904+01	.2706+00	.1909+00	.3404+01	.2276+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3865+01					.3477+01	.3668+01	.3939+01	.3939+01	.3595+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2155-01	.2050-01	.1907-01	.0000+00	.2350+02	.7293+00	.9629+00	.8477+00	.7885+00	.9900+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7364-01	.6236+02	.3339+02	.1674+02	.6922+02	.3030-01	.3982+00	.2666+00	.5400+00	
	M3EFF	RN12	RN4	RN8	RN14GE	DELTA2	THETA2	VO	VOK
	.2846+00	.6477-01	.1547+05	.1660+06	.5818-01	.5314-01	.8581+00	.7699+03	.4561+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
.3156+03	.9249+02	.2231+03	.1189+01	.3235+03	.9754+00	.1365+03	.1411+03	.3949+03	.5188+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2291+01		.3161+03	.2228+03	.1191+01	.1411+05	.6738+02	.2222-01	.5390+04	.5938+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4198+04	.1284+01	.1033+03	.2106+03	.4459+02	.4324+02	.1312+04	.2021+04	.2676+03	.0000+00

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P8 RAKE IN THRUST VOID

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DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1447 HRS 9 SEC CONFIGURATION 3,2 DATA PT. 27.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9567+00	.2784+04	.2024+04	.4224+04	.5548+04	.1313+01		.2206+03	.1755+03	
FJMM8/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMM8	FNMM8	SFCMM8
.1014+01	.1016+01	.9003-02	.7380+02	.1187-02			.3199+03	.2274+03	.1187+01
FJMM8D	FNMM8D	SFCMM8D	FJMM8C	FNMM8C	SFCMM8C	FNMM8CGE	SFCMM8CGE	WMF	WA2GEC
.3204+03	.2271+03	.1168+01	.6019+04	.4279+04	.1260+01	.4305+04	.1289+01	.0000+00	.6806+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.7100+00	.6630+00	.1790+01	.9673+00	.7860+00	.1137-01	-.7744-02	.4532-03	-.5507-03	.1833-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.2056-02	-.1137-01	.3606-03	.9020-03	.1727+04	.1201+01				

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DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1508 HRS 1 SEC CONFIGURATION 3.2 DATA PT. 28.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	F6	WFE	SA	HL
N+3990.	.8689+00	.0000+00	.1053+03	.1346+05	.9862+02	.1827+03	.2559+03	.5117+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.8475+00	.4428+03	.4573+03	.1179+04	.2634+04	.2565+04	.1929+04	.1881+04	.1825+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1637+01	.7919+00	.8049+00	.6139+00	.6802+00	.5734+00	.3289+01	.1006+02	.9653+01
PS5CALC	P4CALC	P5.2	P7	PLS					PO
.9536+01	.9632+01	.2114+01	.2049+01	.4318+00					.4312+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4837+00	.4915+00	.1578+01	.1478+02	.9600+00	.4757+01	.9579+00	.3108+01	.4902+01	.4753+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	P58/P7
.2579+01	.4114+01	.1275+01	.2056+01	.3331+01	.3337+01	.2332+00	.1645+00	.2933+01	.2107+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3331+01					.3004+01	.3169+01	.3402+01	.3402+01	.3098+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2424-01	.2295-01	.2134-01	.0000+00	.4146+02	.7160+00	.9646+00	.8300+00	.7730+00	.9981+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7262-01	.6263+02	.3177+02	.1666+02	.6981+02	.3046-01	.3930+00	.2444+00	.5484+00	
	M3EFF	RN12	RN4	RN8	RN14GE	DELTA2	THETA2	VC	VOK
	.2788+00	.5445-01	.1282+05	.1366+06	.4833-01	.4628-01	.8816+00	.8274+03	.4902+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.2863+03	.8566+02	.2006+03	.1276+01	.2961+03	.9669+00	.1379+03	.1413+03	.3973+03	.4200+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2051+01		.2878+03	.1999+03	.1280+01	.1434+05	.6758+02	.2421-01	.5889+04	.6185+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4338+04	.1359+01	.1050+03	.2173+03	.4567+02	.4428+02	.1338+04	.2134+04	.2658+03	.0000+00

ONLINE

P8 RAKE IN THRUST VOID

CONFIDENTIAL

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1506 HRS 1 SEC CONFIGURATION 3.2 DATA PT. 26.0

EFFBURNGE	T4CGE	T5,1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PS8A8	
.9583+00	.2913+04	.2137+04	.4357+04	.6031+04	.1384+01		.1982+03	.1571+03	
FJMMB/FJS	T8/T5,5	DPLS	PEA8H	PUSTB			FJMMB	FNMMB	SFCMMB
.1019+01	.1026+01	-.8278-03	.6094+02	-.5016-02			.2917+03	.2060+03	.1242+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.2932+03	.2053+03	.1246+01	.6303+04	.4452+04	.1323+01	.4474+04	.1348+01	.0000+00	.6771+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.6242+00	.5772+00	.1595+01	.9758+00	.6828+00	.1190-02	-.9972-03	.1468-02	-.1113-02	.8590-03
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.4295-03	.1871-03	.6539-03	.6638-04	.1872+04	.1199+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-1 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1532 HRS 8 SEC CONFIGURATION 3.2 DATA PT. 30.0

(ALT)D N+5690.	(MO)D .8540+00	DTO .0000+00	PLA .1054+03	N .1345+05	PCN .9857+02	FS .1752+03	WFE .2354+03	SA .5118+02	WL .1561+05
WCW -.1559+01	TT1D .4392+03	T2 .4563+03	T3 .1177+04	T3.9CALC .2648+04	T4CALC .2579+04	T5.0CALC .1946+04	T5.1CALC .1897+04	T5.5AVG .1830+04	
	POO .1465+01	PSINA .7086+00	PSINB .7212+00	PSI .5577+00	P2 .6181+00	PS2 .5246+00	P2DIST .2994+01	P3X .9039+01	PS3 .8716+01
PS3CALC .8574+01	P4CALC .8659+01	P5.2 .1916+01	P7 .1857+01	PLS .4138+00					PO .4135+00
PSINA/POO .4836+00	PSINB/POO .4922+00	P2/PO .1495+01	P3/P2 .1463+02	PS3/P3 .9643+00	P3/P5.2 .4719+01	P4/P3GE .9580+00	P5.2/P2 .3100+01	P5.2/PO .4633+01	P7/PO .4491+01
T3/T2 .2578+01	T5.1CALC/T2 .4158+01	WAINA .1145+01	WAINB .1847+01	WAIN .2992+01	WA2GE .2990+01	WC3 .2095+00	WC4 .1478+00	WA3.1 .2635+01	PS8/P7 .2228+00
WA5.1 .2992+01					WG3.9 .2700+01	WG4 .2848+01	WG5.1 .3058+01	WG8 .3058+01	WA4 .2783+01
FE3.9 .2481-01	FE4 .2350-01	FE5.1 .2185-01	HPE .0000+00	QSW -.3612+03	EFFCOMP .7124+00	EFFBURN .9551+00	EFFTURB .8261+00	EFFROTOR .7592+00	WAIN/WA2GE .1001+01
DH4-5/T4 .7198-01	VR3 .6244+02	CIP .2883+02	WRT/P4CALC .1670+02	WRT/P5.2 .6953+02	TPL5.2 .3054-01	M1 .3955+00	M3 .2308+00	M5.2 .5454+00	
	M3EFF .2783+00	RNI2 .4962-01	RN4 .1149+05	RN8 .1222+06	RNI4GE .4320-01	DELTA2 .4205-01	THETA2 .8798+00	VO .7802+03	VOK .4623+03
FJS .2620+03	FR .7256+02	FNS .1894+03	SFC .1243+01	FJCN .2641+03	CFJCN .9919+00	ABEFF .1374+03	ABHOT .1413+03	TOD .3982+03	POD .3876+00
P7X .1854+01		FJSD .2655+03	FNSD .1878+03	SFCD .1253+01	NC2 .1434+05	WAINC .6674+02	FE5.1C .2484-01	WFEC .5968+04	FJSC .6229+04
FNSC .4504+04	SFCC .1325+01	PCNC .1051+03	P3C .2149+03	P5.2C .4555+02	P7C .4416+02	T3C .1337+04	T5.1C .2157+04	N/RT4 .2649+03	WSRT/WPRT .0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1532 HRS 8 SEC CONFIGURATION 3.2 DATA PT. 30.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PS8A8	
.9488+00	.2935+04	.2159+04	.4527+04	.6113+04	.1350+01		.1788+03	.1424+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9931+00	.1031+01	.3622-03	.5848+02	.3117-03			.2602+03	.1876+03	.1255+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.2637+03	.1860+03	.1266+01	.6186+04	.4461+04	.1338+01	.4484+04	.1363+01	.0000+00	.6669+02
PSLS	PS2W	PS7	QD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-1(+)	D-DPOO-1(-)	D-DPO(+)
.5730+00	.5281+00	.1441+01	.9723+00	.6212+00	.1191-01	-.6353-02	.7239-03	-.9622-03	.1782-02
D-DPD(-)	DPOO AV	DPUO IAV	DPO AV	TB	CFJSV				
-.2829-02	-.1191-01	.3628-03	.2829-02	.1887+04	.1221+01				

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DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1537 HRS 21 SEC CONFIGURATION 3.2 DATA PT. 31.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N+5760.	.8565+00	.0000+00	.1054+03	.1345+05	.9856+02	.1757+03	.2390+03	.5118+02	.1861+05
WCH	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.1439+01	.4395+03	.4567+03	.1177+04	.2668+04	.2598+04	.1967+04	.1917+04	.1846+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1465+01	.7088+00	.7217+00	.5585+00	.6175+00	.5228+00	.2682+01	.9020+01	.8698+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.8558+01	.8639+01	.1926+01	.1867+01	.4102+00					.4100+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4839+00	.4927+00	.1506+01	.1461+02	.9643+00	.4684+01	.9578+00	.3118+01	.4697+01	.4554+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2577+01	.4197+01	.1145+01	.1846+01	.2991+01	.3004+01	.2093+00	.1477+00	.2634+01	.2197+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.2991+01					.2700+01	.2848+01	.3057+01	.3057+01	.2781+01
FE3.9	FE4	FE5.1	WPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2520-01	.2387-01	.2220-01	.0000+00	-.2323+03	.7125+00	.9545+00	.8229+00	.7677+00	.9955+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7144-01	.6256+02	.2873+02	.1680+02	.6950+02	.3055-01	.3924+00	.2305+00	.5454+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2788+00	.4952-01	.1144+05	.1214+06	.4276-01	.4202-01	.8805+00	.7874+03	.4665+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
.2636+03	.7319+02	.1904+03	.1255+01	.2662+03	.9901+00	.1374+03	.1413+03	.3983+03	.3863+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1860+01		.2668+03	.1889+03	.1265+01	.1434+05	.6679+02	.2521-01	.6061+04	.6273+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPWT
.4531+04	.1338+01	.1050+03	.2147+03	.4583+02	.4443+02	.1337+04	.2177+04	.2640+03	.0000+00

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DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1537 HRS 21 SEC CONFIGURATION 3.2 DATA PT. 31.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9482+00	.2954+04	.2180+04	.4554+04	.6207+04	.1363+01		.1797+03	.1432+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9951+00	.1033+01	.8796-03	.5794+02	.2728-03			.2623+03	.1891+03	.1264+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.2655+03	.1876+03	.1274+01	.6242+04	.4500+04	.1347+01	.4523+04	.1372+01	.0000+00	.6709+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.5725+00	.5282+00	.1445+01	.9719+00	.6210+00	.1086-01	-.8090-02	.6698-03	-.8452-03	.9039-03
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1456-02	-.1086-01	-.2707-05	-.4764-03	.1907+04	.1219+01				

ONLINE

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DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1546 HRS 23 SEC CONFIGURATION 3.2 DATA PT. 32.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	F6	WFE	SA	HL
N+5880.	.8632+00	.0000+00	.1234+03	.1367+05	.1002+03	.1851+03	.2503+03	.5118+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1428+01	.4402+03	.4577+03	.1193+04	.2731+04	.2659+04	.2018+04	.1965+04	.1890+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1487+01	.7204+00	.7335+00	.5579+00	.6184+00	.5206+00	.3129+01	.9246+01	.8917+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.8773+01	.8859+01	.1977+01	.1916+01	.4186+00					.4186+00
PSINA/P00	PSINB/P00	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4846+00	.4934+00	.1478+01	.1495+02	.9644+00	.4677+01	.9581+00	.3196+01	.4723+01	.4578+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WG3	WC4	WA3.1	P58/P7
.2607+01	.4293+01	.1161+01	.1672+01	.3033+01	.3042+01	.2123+00	.1498+00	.2671+01	.2185+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3033+01					.2740+01	.2890+01	.3102+01	.3102+01	.2820+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2604-01	.2466-01	.2293-01	.0000+00	-.1281+03	.7071+00	.9585+00	.8212+00	.7641+00	.9969+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7130-01	.6275+02	.2977+02	.1682+02	.6957+02	.3055-01	.3971+00	.2303+00	.5467+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2776+00	.4945-01	.1145+05	.1214+05	.4274-01	.4208-01	.8824+00	.7709+03	.4568+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.2711+03	.7267+02	.1984+03	.1262+01	.2739+03	.9898+00	.1378+03	.1414+03	.3983+03	.3842+00
P7X		FJSD	FNSD	SFOD	NO2	WAINC	FE5.1C	WFEC	FJSC
.1911+01		.2758+03	.1962+03	.1276+01	.1455+05	.6770+02	.2598-01	.6333+04	.6448+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4715+04	.1343+01	.1066+03	.2197+03	.4698+02	.4554+02	.1352+04	.2227+04	.2651+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL, RD0820-11 RUN DATE 05-23-68 TIME 1546 HRS 23 SEC CONFIGURATION 3,2 DATA PT. 32.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PS8A8	
.9522+00	.3017+04	.2230+04	.4739+04	.6483+04	.1368+01		.1846+03	.1472-03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9954+00	.1035+01	.1604-02	.5919+02	.3708-03			.2698+03	.1971+03	.1270+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.2745+03	.1949+03	.1284+01	.6412+04	.4585+04	.1352+01	.4709+04	.1377+01	.0000+00	.6791+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.5731+00	.5265+00	.1485+01	.9729+00	.6219+00	.1096-01	-.7627-02	.4895-03	-.6654-03	.1165-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.9787-03	-.1096-01	.6265-03	-.8720-04	.1955+04	.1219+01				

ONLINE

DATE= 9/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1551 HRS 46 SEC CONFIGURATION 3.2 DATA PT. 33.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N+ 6080.	.8613+00	.0000+00	.1234+03	.1367+05	.1002+03	.1824+03	.2450+03	.5118+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1472+01	.4398+03	.4876+03	.1193+04	.2719+04	.2647+04	.2005+04	.1953+04	.1883+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1466+01	.7111+00	.7238+00	.5516+00	.6114+00	.5144+00	.2282+01	.9136+01	.8616+01
PS3CALC	P4CALC	P5.2	P7	PL6					PO
.8870+01	.8755+01	.1951+01	.1891+01	.4155+00					.4152+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4851+00	.4937+00	.1473+01	.1498+02	.9649+00	.4683+01	.9583+00	.3191+01	.4699+01	.4556+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	P58/P7
.2608+01	.4269+01	.1145+01	.1847+01	.2992+01	.3012+01	.2095+00	.1478+00	.2635+01	.2197+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.2992+01					.2703+01	.2851+01	.3060+01	.3060+01	.2783+01
FE3.9	FE4	FE5.1	WPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2582+01	.2445+01	.2274+01	.0000+00	-.1035+03	.7067+00	.9579+00	.8245+00	.7656+00	.9935+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7163-01	.6265+02	.2950+02	.1675+02	.6933+02	.3056+01	.3954+00	.2286+00	.5436+00	
	M3EFF	RN12	RN4	RN8	RN14GE	DELTA2	THETA2	VO	VOK
	.2771+00	.4891-01	.1133+05	.1202+06	.4245-01	.4160-01	.8822+00	.7679+03	.4550+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	[illegible]
.2667+03	.7141+02	.1953+03	.1254+01	.2691+03	.9911+00	.1371+03	.1414+03	.3985+03	.3606+00
P7X		FUSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1884+01		.2714+03	.1930+03	.1269+01	.1456+05	.6755+02	.2578+01	.6269+04	.6411+04
FNBC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4695+04	.1335+01	.1066+03	.2196+03	.4690+02	.4546+02	.1353+04	.2215+04	.2657+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1551 HRS 46 SEC CONFIGURATION 3.2 DATA PT. 33.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9516+00	.3004+04	.2217+04	.4718+04	.6419+04	.1360+01		.1815+03	.1452+03	
FJMMB/FJS	T8/T5.5	DPLS	[illegible]	POSTB			FJMMB	FNMMB	SFCMMB
.9948+00	.1032+01	.2070-03	.5870+02	-.2163-02			.2653+03	.1939+03	.1263+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.2700+03	.1917+03	.1278+01	.6378+04	.4661+04	.1345+01	.4685+04	.1370+01	.0000+00	.6800+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.5679+00	.5192+00	.1464+01	.9695+00	.6143+00	.1006-01	-.7476-02	.7656-03	-.5599-03	.1352-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1512-02	-.1006-01	-.5415-03	.1231-02	.1943+04	.1217+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1600 HRS 55 SEC CONFIGURATION 3.2 DATA PT. 34.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	F6	WFE	SA	WL
N + 6170.	.8622+00	.0000+00	.1234+03	.1368+05	.1002+03	.1769+03	.2447+03	.5117+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1023+01	.4399+03	.4578+03	.1194+04	.2723+04	.2651+04	.2008+04	.1957+04	.1882+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1462+01	.7089+00	.7212+00	.5502+00	.6095+00	.5139+00	.2944+01	.9116+01	.8798+01
PS3CALC	P4CALC	P5.2	P7	PLS					P0
.8651+01	.8736+01	.1945+01	.1886+01	.4119+00					.4119+00
PSINA/P00	PSINB/P00	P2/P0	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/P0	P7/P0
.4850+00	.4934+00	.1480+01	.1496+02	.9651+00	.4686+01	.9583+00	.3192+01	.4724+01	.4579+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2609+01	.4274+01	.1142+01	.1841+01	.2983+01	.2989+01	.2088+00	.1474+00	.2627+01	.2185+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.2983+01					.2695+01	.2842+01	.3051+01	.3051+01	.2774+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2588-01	.2451-01	.2279-01	.0000+00	-.4976+03	.7065+00	.9578+00	.8238+00	.7651+00	.9979+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7159-01	.6264+02	.2947+02	.1675+02	.6937+02	.3056-01	.3978+00	.2280+00	.5443+00	
	M3EFF	RN12	RN4	RN8	RN14GE	DELTA2	THETA2	VO	VOK
	.2770+00	.4873-01	.1128+05	.1197+06	.4229-01	.4147-01	.8825+00	.7725+03	.4577+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.2619+03	.7162+02	.1903+03	.1286+01	.2688+03	.9743+00	.1372+03	.1414+03	.3985+03	.3790+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1880+01		.2663+03	.1881+03	.1301+01	.1456+05	.6757+02	.2583-01	.6282+04	.6314+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4588+04	.1369+01	.1067+03	.2198+03	.4691+02	.4547+02	.1353+04	.2217+04	.2656+03	.0000+00

ONLINE

P8 RAKE IN THRUST VOID

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

1-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1600 HRS 55 SEC CONFIGURATION 3.2 DATA PT. 34.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PS8A8	
.9515+00	.3007+04	.2220+04	.4611+04	.6431+04	.1395+01		.1811+03	.1448+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.1012+01	.1034+01	-.1035-03	.5824+02	.7900-03			.2650+03	.1934+03	.1265+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.2694+03	.1912+03	.1280+01	.6389+04	.4662+04	.1347+01	.4686+04	.1372+01	.0000+00	.6771+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.5658+00	.5189+00	.1463+01	.9699+00	.6136+00	.1079-01	-.7634-02	.8068-03	-.7380-03	.1074-02
D-DPO(-)	DPOO AV	DPUO IAV	DPO AV	T8	CFJSV				
-.1661-02	-.1079-01	.7380-03	.9000-03	.1946+04	.1200+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1612 HRS 0 SEC CONFIGURATION 3.2 DATA PT. 35.0

(ALT)D	(MO)D	DTD	PLA	N	PCN	FS	WFE	SA	WL
N+5940.	.9351+00	.0000+00	.1108+03	.1371+05	.1004+03	.1862+03	.2578+03	.5118+02	.1661+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1088+01	.4561+03	.4680+03	.1206+04	.2709+04	.2638+04	.1992+04	.1942+04	.1870+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1610+01	.7770+00	.7906+00	.6004+00	.6666+00	.5611+00	.2404+01	.9750+01	.9362+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.9235+01	.9330+01	.2082+01	.2018+01	.4170+00					.4167+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4825+00	.4910+00	.1600+01	.1462+02	.9623+00	.4684+01	.9569+00	.3122+01	.4995+01	.4842+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	WS8/P7
.2576+01	.4149+01	.1236+01	.1992+01	.3228+01	.3246+01	.2260+00	.1595+00	.2843+01	.2066+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3228+01					.2914+01	.3074+01	.3300+01	.3300+01	.3002+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2519-01	.2385-01	.2218-01	.0000+00	-.6587+03	.7116+00	.9663+00	.8316+00	.7716+00	.9946+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7218-01	.6399+02	.3097+02	.1692+02	.6985+02	.3049-01	.3981+00	.2372+00	.5496+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2820+00	.5179-01	.1224+05	.1300+06	.4541-01	.4537-01	.9023+00	.8488+03	.5029+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TJD	PJD
.2898+03	.8516+02	.2046+03	.1260+01	.2929+03	.9893+00	.1381+03	.1414+03	.3984+03	.3831+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2014+01		.2944+03	.2026+03	.1273+01	.1443+05	.6759+02	.2458-01	.5982+04	.6367+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPWT
.4510+04	.1326+01	.1057+03	.2149+03	.4588+02	.4448+02	.1336+04	.2152+04	.2669+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1612 HRS 0 SEC CONFIGURATION 3.2 DATA PT. 35.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9599+00	.2926+04	.2154+04	.4529+04	.6099+04	.1347+01		.1952+03	.1549+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	PUSTB			FJMMB	FNMMB	SFCMMB
.9953+00	.1033+01	.2949-02	.5892+02	.1275-02			.2884+03	.2033+03	.1288+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.2930+03	.2012+03	.1281+01	.6357+04	.4480+04	.1335+01	.4499+04	.1356+01	.0000+00	.6796+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.6095+00	.5668+00	.1563+01	.9767+00	.6697+00	.1011-01	-.7445-02	.7391-03	-.1147-02	.1409-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1238-02	-.1011-01	.2794-03	.7406-03	.1932+04	.1222+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC,
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1619 HRS 54 SEC CONFIGURATION 3.2 DATA PT. 36.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	HL
N+6770.	.9704+00	.0000+00	.1234+03	.1383+05	.1013+03	.1856+03	.2626+03	.5118+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.1504+01	.4636+03	.4739+03	.1222+04	.2762+04	.2690+04	.2037+04	.1985+04	.1902+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1610+01	.7813+00	.7938+00	.6015+00	.6674+00	.5616+00	.2770+01	.9782+01	.9420+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.9271+01	.9364+01	.2084+01	.2020+01	.4125+00					.4126+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4854+00	.4932+00	.1618+01	.1466+02	.9630+00	.4695+01	.9573+00	.3122+01	.5050+01	.4896+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2579+01	.4189+01	.1225+01	.1976+01	.3201+01	.3230+01	.2241+00	.1581+00	.2819+01	.2042+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3201+01					.2892+01	.3050+01	.3274+01	.3274+01	.2977+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2588-01	.2451-01	.2279-01	.0000+00	-.4148+03	.7101+00	.9688+00	.8260+00	.7581+00	.9911+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7186-01	.6412+02	.3148+02	.1689+02	.7001+02	.3051-01	.3988+00	.2349+00	.5519+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2805+00	.5130-01	.1201+05	.1273+06	.4460-01	.4541-01	.9137+00	.8632+03	.5114+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.2908+03	.8587+02	.2049+03	.1281+01	.2946+03	.9873+00	.1385+03	.1414+03	.3988+03	.3685+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.2022+01		.2968+03	.2023+03	.1298+01	.1447+05	.6738+02	.2494-01	.6050+04	.6408+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4513+04	.1341+01	.1060+03	.2154+03	.4588+02	.4448+02	.1338+04	.2173+04	.2667+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1619 HRS 54 SEC CONFIGURATION 3,2 DATA PT. 36.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PS8A8	
.9624+00	.2947+04	.2175+04	.4529+04	.6153+04	.1359+01		.1958+03	.1552+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9965+00	.1039+01	.4657-02	.5835+02	.3713-03			.2898+03	.2039+03	.1288+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.2958+03	.2013+03	.1305+01	.6382+04	.4490+04	.1347+01	.4507+04	.1365+01	.0000+00	.6798+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(-)
.6115+00	.5670+00	.1572+01	.9790+00	.6711+00	.1152-01	-.8465-02	.1101-02	-.8436-03	.1717-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.1088-02	-.1152-01	-.5647-03	-.4816-03	.1975+04	.1222+01				

ONLINE

DATE: 9/23/68
GROUP: 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL: RD0820-11 RUN DATE 05-23-68 TIME 1635 HRS 32 SEC CONFIGURATION 3.2 DATA PT. 37.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	ML
N+4510.	.8743+00	.0000+00	.1031+03	.1333+05	.9764+02	.1727+03	.2357+03	.5119+02	.1061+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.9679+00	.4381+03	.4584+03	.1158+04	.2544+04	.2478+04	.1858+04	.1813+04	.1777+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1571+01	.7627+00	.7751+00	.6045+00	.6677+00	.5658+00	.3058+01	.9320+01	.8957+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.8807+01	.8902+01	.2011+01	.1950+01	.4074+00					.4078+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4853+00	.4932+00	.1637+01	.1396+02	.9610+00	.4634+01	.9551+00	.3012+01	.4931+01	.4781+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2585+01	.3955+01	.1230+01	.1984+01	.3214+01	.3235+01	.2250+00	.1588+00	.2830+01	.2090+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3214+01					.2895+01	.3054+01	.3279+01	.3279+01	.2989+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2318-01	.2191-01	.2038-01	.0000+00	-.2258+03	.7196+00	.9549+00	.8463+00	.7830+00	.9935+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7278-01	.6398+02	.2835+02	.1708+02	.6942+02	.3047-01	.3942+00	.2413+00	.5433+00	
	M3EFF	RN12	RN4	RN8	RN14GE	DELTA2	THETA2	VO	VOK
	.2884+00	.5329-01	.1260+05	.1346+06	.4641-01	.4543-01	.8837+00	.8585+03	.5087+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.2794+03	.8575+02	.1936+03	.1217+01	.2803+03	.9967+00	.1370+03	.1412+03	.3976+03	.4099+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1951+01		.2791+03	.1938+03	.1217+01	.1418+05	.6650+02	.2306-01	.5520+04	.6150+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4263+04	.1295+01	.1039+03	.2052+03	.4427+02	.4292+02	.1310+04	.2051+04	.2677+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1635 HRS 32 SEC CONFIGURATION 3.2 DATA PT. 37.0

EFFBURNGE	T4CGE	T5,1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9486+00	.2808+04	.2054+04	.4284+04	.5650+04	.1319+01		.1076+03	.1492+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.9902+00	.1015+01	.9468-02	.5759+02	.4434-02			.2767+03	.1909+03	.1235+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WMF	WA2GEC
.2764+03	.1910+03	.1234+01	.6090+04	.4202+04	.1314+01	.4223+04	.1338+01	.0000+00	.6694+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.6100+00	.5728+00	.1517+01	.9704+00	.6728+00	.1300-01	-.1006-01	.5550-03	-.1004-02	.5729-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.7425-02	-.1300-01	.1004-02	-.2157-02	.1804+04	.1224+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1644 HRS 13 SEC CONFIGURATION 3.2 DATA PT. 38.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N+4040.	.8529+00	.0000+00	.9978+02	.1320+05	.9668+02	.1717+03	.2328+03	.5120+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.9022+00	.4350+03	.4551+03	.1144+04	.2523+04	.2458+04	.1846+04	.1801+04	.1757+04	
	PUO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1552+01	.7514+00	.7669+00	.6057+00	.6677+00	.5690+00	.3109+01	.9246+01	.8882+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.8743+01	.8837+01	.1993+01	.1932+01	.4128+00					.4137+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4840+00	.4940+00	.1614+01	.1385+02	.9606+00	.4640+01	.9557+00	.2985+01	.4817+01	.4670+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2514+01	.3957+01	.1220+01	.1967+01	.3186+01	.3206+01	.2230+00	.1574+00	.2806+01	.2138+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3186+01					.2870+01	.3028+01	.3251+01	.3251+01	.2963+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2305-01	.2183-01	.2030-01	.0000+00	-.2878+03	.7225+00	.9516+00	.8397+00	.7811+00	.9938+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7227-01	.6321+02	.2812+02	.1699+02	.6923+02	.3047-01	.3908+00	.2427+00	.5410+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2864+00	.5378-01	.1255+05	.1340+06	.4648-01	.4543-01	.8775+00	.8442+03	.5002+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	PUD
.2760+03	.8360+02	.1924+03	.1210+01	.2757+03	.1001+01	.1366+03	.1412+03	.3973+03	.4193+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1925+01		.2753+03	.1927+03	.1208+01	.1409+05	.6569+02	.2313-01	.5471+04	.6076+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPKT
.4236+04	.1292+01	.1032+03	.2035+03	.4386+02	.4253+02	.1304+04	.2053+04	.2662+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

J-4 TEST CELL RDU820-11 RUN DATE 05-23-68 TIME 1644 HRS 13 SEC CONFIGURATION 3,2 DATA PT. 38.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBVB	PSBAB	
.9453+00	.2805+04	.2055+04	.4258+04	.5607+04	.1317+01		.1854+03	.1478+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.9863-00	.1020+01	.7140-02	.5841+02	.2008-02			.2723+03	.1887+03	.1234+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.2715+03	.1890+03	.1232+01	.5993+04	.4153+04	.1317+01	.4174+04	.1343+01	.0000+00	.6610+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-1(+)	D-DPOO-1(-)	D-DPO(+)
.6096+00	.5742+00	.1497+01	.9677+00	.6730+00	.1189-01	-.8485-02	.5664-03	-.7153-03	.1067-01
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.1434-01	-.1189-01	.5350-03	.1226-01	.1792+04	.1226+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1659 HRS 55 SEC CONFIGURATION 3,2 DATA PT. 39.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	ML
N+5080.	.8535+00	.0000+00	.9626+02	.1308+05	.9580+02	.1549+03	.2121+03	.5120+02	.1061+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.7818+00	.4394+03	.4559+03	.1137+04	.2510+04	.2444+04	.1839+04	.1794+04	.1758+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	PSX	PS3
	.1420+01	.6885+00	.7026+00	.5827+00	.6358+00	.5507+00	.2739+01	.8637+01	.8317+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.8196+01	.8278+01	.1824+01	.1769+01	.4107+00					.4106+00
PSINA/PUO	PSINB/PUO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4850+00	.4949+00	.1549+01	.1358+02	.9629+00	.4734+01	.9584+00	.2869+01	.4443+01	.4308+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2495+01	.3936+01	.1110+01	.1789+01	.2899+01	.2926+01	.2029+00	.1432+00	.2553+01	.2322+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.2899+01					.2612+01	.2755+01	.2958+01	.2958+01	.2696+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2308-01	.2185-01	.2032-01	.0000+00	-.1697+03	.7245+00	.9448+00	.8243+00	.7744+00	.9901+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7184-01	.6119+02	.2710+02	.1645+02	.6867+02	.3054-01	.3667+00	.2353+00	.5346+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2773+00	.5111-01	.1146+05	.1222+06	.4381-01	.4326-01	.8789+00	.8106+03	.4803+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	PUD
.2468+03	.7303+02	.1738+03	.1220+01	.2460+03	.1003+01	.1355+03	.1412+03	.3979+03	.3990-00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1758+01		.2484+03	.1732+03	.1224+01	.1395+05	.6281+02	.2312-01	.5229+04	.5705+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4017+04	.1302+01	.1022+03	.1996+03	.4217+02	.4088+02	.1294+04	.2041+04	.2645+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

I-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1659 HRS 55 SEC CONFIGURATION 3.2 DATA PT. 39.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9385+00	.2785+04	.2044+04	.4038+04	.5357+04	.1327+01		.1684+03	.1353+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9655+00	.1015+01	.3984-02	.5798+02	.9017-03			.2432+03	.1702+03	.1245+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WAF	WA2GEC
.2448+03	.169[illegible]3	.1250+01	.5623+04	.3935+04	.1329+01	.3955+04	.1355+01	.0000+00	.6344+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.5909+00	.5549+00	.1367+01	.9598+00	.6394+00	.1268-01	-.8084-02	.1083-02	-.7829-03	.4220-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8		CFJSV			
-.4115-02	-.1268-01	.2420-03	.5772-03	.1785+04	.1220+01				

ONLINE

DATE= 5/23/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1705 HRS 18 SEC CONFIGURATION 3.2 DATA PT. 40.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N+4940.	.8474+00	.0000+00	.9492+02	.1301+05	.9533+02	.1526+03	.2088+03	.5121+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
-.5847+00	.4373+03	.4550+03	.1125+04	.2485+04	.2420+04	.1825+04	.1780+04	.1747+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1403+01	.6815+00	.6925+00	.5840+00	.6359+00	.5526+00	.2530+01	.8422+01	.8109+01
PS3CALC	P4CALC	P5.2	P7	PLS					PC
.7983+01	.8084+01	.1796+01	.1741+01	.4142+00					.4147+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4856+00	.4935+00	.1534+01	.1324+02	.9628+00	.4689+01	.9575+00	.2825+01	.4332+01	.4200+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2472+01	.3913+01	.1099+01	.1773+01	.2872+01	.2905+01	.2010+00	.1419+00	.2529+01	.2378+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.2872+01					.2587+01	.2729+01	.2930+01	.2930+01	.2871+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2293-01	.2171-01	.2019-01	.0000+00	-.5537+03	.7261+00	.9402+00	.8226+00	.7744+00	.9885+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7125-01	.6148+02	.2600+02	.1665+02	.6882+02	.3055-01	.3630+00	.2357+00	.5362+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2804+00	.5125-01	.1141+05	.1216+06	.4314-01	.4327-01	.8771+00	.8015+03	.4749+03
FJS	FR	FNS	SFC	FJCN	CFJCN	ABEFF	ABHOT	TOD	POD
.2429+03	.7154+02	.1714+03	.1218+01	.2413+03	.1007+01	.1358+03	.1411+03	.3978+03	.4016+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1733+01		.2447+03	.1707+03	.1223+01	.1389+05	.6217+02	.2302-01	.5153+04	.5614+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPHT
.3960+04	.1301+01	.1018+03	.1947+03	.4152+02	.4025+02	.1282+04	.2030+04	.2645+03	.0000+00

ONLINE

DATE= 5/23/68
GROUP 1
ARO,INC.
ARNOLD AIR FORCE STATION,TENN

T-4 TEST CELL RD0820-11 RUN DATE 05-23-68 TIME 1705 HRS 18 SEC CONFIGURATION 3.2 DATA PT. 40.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		MBV8	PSBAB	
.9340+00	.2763+04	.2032+04	.3981+04	.5281+04	.1327+01		.1662+03	.1331+03	
FJMMB/FJS	T8/T5.5	DPLS	PEABH	POSTB			FJMMB	FNMMB	SFCMMB
.9814+00	.1014+01	.6002-02	.5853+02	.1567-02			.2384+03	.1668+03	.1251+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.2402+03	.1662+03	.1256+01	.5510+04	.3856+04	.1336+01	.3877+04	.1362+01	.0000+00	.6289+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.5919+00	.5578+00	.1046+01	.9621+00	.6396+00	.1188-01	-.7454-02	.9156-03	-.7656-03	.4039-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV				
-.2977-02	-.1188-01	.3806-03	-.4549-03	.1771+04	.1226+01				

ONLINE

DATE= 7/ 2/68
GROUP 1
ARO, INC.
ARNOLD AIR FORCE STATION, TENN

T-4 TEST CELL RD0820-13 RUN DATE 05-29-68 TIME 916 HRS 23 SEC CONFIGURATION 3,2 DATA PT. 7.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	HL
N+5790.	.9014+00	.0000+00	.1233+03	.1368+05	.1002+03	.1903+03	.2667+03	.5111+02	.1861+05
WCW	TT1D	T2	T3	T3,9CALC	T4CALC	T5,0CALC	T5,1CALC	T5,5AVG	
.3053+02	.4470+03	.4630+03	.1204+04	.2783+04	.2709+04	.2064+04	.2010+04	.1963+04	
	PUO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1554+01	.7500+00	.7639+00	.5831+00	.6469+00	.5431+00	.3085+01	.9672+01	.9315+01
PS3CALC	P4CALC	P5,2	P7	PLS					PO
.9181+01	.9270+01	.2088+01	.2024+01	.4017+00					.4020+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5,2	P4/P3GE	P5,2/P2	P5,2/PO	P7/PO
.4827+00	.4917+00	.1609+01	.1495+02	.9630+00	.4633+01	.9584+00	.3227+01	.5192+01	.5034+01
T3/T2	T5,1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3,1	PS8/P7
.2599+01	.4341+01	.1204+01	.1942+01	.3146+01	.3181+01	.2202+00	.1554+00	.2770+01	.1985+00
WA5,1					WG3,9	WG4	WG5,1	WG8	WA4
.3146+01					.2844+01	.3000+01	.3220+01	.3220+01	.2926+01
FE3,9	FE4	FE5,1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2675-01	.2532-01	.2355-01	.0000+00	.6032+04	.7099+00	.9629+00	.8174+00	.7637+00	.9689+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5,2	TPL5,2	M1	M3	M5,2	
.7067-01	.6275+02	.3132+02	.1684+02	.6915+02	.3053-01	.4011+00	.2348+00	.5424+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2763+00	.5095-01	.1176+05	.1243+06	.4381-01	.4401-01	.8927+00	.8489+03	.5030+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
.2920+03	.8300+02	.2090+03	.1276+01	.2931+03	.9964+00	.1368+03	.1415+03	.3983+03	.3857+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5,1C	WFEC	FJSC
.2017+01		.2943+03	.2081+03	.1282+01	.1448+05	.6753+02	.2638-01	.6414+04	.6635+04
FNSC	SFCC	PCNC	P3C	P5,2C	P7C	T3C	T5,1C	N/RT4	WSRT/WPRT
.4750+04	.1350+01	.1061+03	.2198+03	.4743+02	.4598+02	.1348+04	.2252+04	.2628+03	.0000+00

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T-4 TEST CELL RD0820-13 RUN DATE 05-29-68 TIME 916 HRS 23 SEC CONFIGURATION 3,2 DATA PT. 7.0

EFFBURNGE	T4CGE	T5,1CGE	FNSCGE	WFECGE	SFCCGE		M8V6	PS8A8	
,9565+00	,3038+04	,2254+04	,4771+04	,6553+04	,1373+01		,1937+03	,1556+03	
FJMMB/FJS	T8/T5,5	DPLS	PEABH	POSTB			FJMMB	FNMM8	SFCMMB
,9916+00	,1019+01	[illegible]	,5689+02	-,3837-03			,2896+03	,2066+03	,1291+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
,2918+03	,2056+03	,1297+01	,6580+04	,4694+04	,1366+01	,4715+04	,1390+01	,0000+00	,6829+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
,6258+00	,5503+00	,1565+01	,9669+00	,6515+00	,1299-01	-,1102-01	,8731-03	-,7946-03	,1572-02
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV	P8			
-,2623-02	-,1299-01	-,1825-03	-,6491-03	,2000+04	,1218+01	,0000+00			

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T-4 TEST CELL RD0820-13 RUN DATE 05-29-68 TIME 925 HRS 7 SEC CONFIGURATION 3.2 DATA PT. 12.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	ML
N+6220.	.9040+00	.0000+00	.1233+03	.1370+05	.1004+03	.1876+03	.2614+03	.5115+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.3053+02	.4444+03	.4637+03	.1207+04	.2783+04	.2709+04	.2062+04	.2008+04	.1966+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1520+01	.7335+00	.7470+00	.5733+00	.6358+00	.5341+00	.3121+01	.9520+01	.9176+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.9038+01	.9125+01	.2049+01	.1987+01	.3964+00					.3965+00
PSINA/P00	PSINB/P00	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4825+00	.4913+00	.1603+01	.1497+02	.9639+00	.4645+01	.9586+00	.3223+01	.5168+01	.5010+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2602+01	.4330+01	.1182+01	.1905+01	.3087+01	.3121+01	.2161+00	.1525+00	.2719+01	.1995+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3087+01					.2791+01	.2944+01	.3160+01	.3160+01	.2871+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2671-01	.2529-01	.2352-01	.0000+00	.6417+04	.7089+00	.9623+00	.8193+00	.7641+00	.9891+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7093-01	.6273+02	.3097+02	.1679+02	.6908+02	.3054-01	.4004+00	.2319+00	.5416+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2758+00	.4999-01	.1154+05	.1221+06	.4313-01	.4326-01	.8939+00	.8466+03	.5016+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
.2871+03	.8124+02	.2059+03	.1270+01	.2872+03	.9997+00	.1367+03	.1415+03	.3985+03	.3761+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1982+01		.2896+03	.2048+03	.1277+01	.1449+05	.6747+02	.2631-01	.6391+04	.6636+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPHT
.4759+04	.1343+01	.1062+03	.2200+03	.4737+02	.4592+02	.1350+04	.2246+04	.2632+03	.0000+00

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T-4 TEST CELL RD0820-13 RUN DATE 05-29-68 TIME 925 HRS 7 SEC CONFIGURATION 3.2 DATA PT. 12.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9560+00	.3034+04	.2248+04	.4780+04	.6527+04	.1365+01		.1900+03	.1528+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POST8			FJMMB	FNMM8	SFCMM8
.9885+00	.1016+01	.6133+00	.5611+02	.3439-03			.2636+03	.2026+03	.1290+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.2863+03	.2014+03	.1298+01	.6560+04	.4682+04	.1365+01	.4703+04	.1388+01	.0000+00	.6821+02
PSLS	PS2H	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.6133+00	.5397+00	.1538+01	.9660+00	.6403+00	.1363-01	-.7580-02	.8276-03	-.1040-02	.8619-03
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV	P8			
-.8215-03	-.1363-01	.8299-04	-.3434-03	.1997+04	.1221+01	.0000+00			

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T-4 TEST CELL RD0820-13 RUN DATE 05-29-68 TIME 1003 HRS 19 SEC CONFIGURATION 3,2 DATA PT, 22,0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	WL
N+6530.	.9088+00	.0000+00	.1233+03	.1370+05	.1004+03	.1853+03	.2571+03	.5115+02	.1861+05
HCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.3053+02	.4456+03	.4646+03	.1207+04	.2775+04	.2702+04	.2055+04	.2001+04	.1971+04	
	P00	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1503+01	.7281+00	.7398+00	.5678+00	.6298+00	.5293+00	.3432+01	.9371+01	.9038+01
PS3CALC	P4CALC	P5.2	P7	PLS					PO
.8894+01	.8980+01	.2024+01	.1962+01	.3896+00					.3894+00
PSINA/P00	PSINB/P00	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4843+00	.4921+00	.1617+01	.1488+02	.9645+00	.4631+01	.9583+00	.3213+01	.5196+01	.5036+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2597+01	.4308+01	.1167+01	.1882+01	.3049+01	.3086+01	.2134+00	.1506+00	.2685+01	.1986+00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3049+01					.2756+01	.2907+01	.3120+01	.3120+01	.2835+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2660-01	.2519-01	.2342-01	.0000+00	.6552+04	.7087+00	.9613+00	.8223+00	.7655+00	.9877+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7105-01	.6293+02	.3043+02	.1682+02	.6897+02	.3055-01	.4019+00	.2301+00	.5403+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2768+00	.4940-01	.1142+05	.1208+06	.4257-01	.4285-01	.8956+00	.8545+03	.5063+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TOD	POD
.2850+03	.8096+02	.2041+03	.1260+01	.2834+03	.1006+01	.1364+03	.1415+03	.3987+03	.3726+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1958+01		.2874+03	.2031+03	.1266+01	.1448+05	.6733+02	.2615-01	.6339+04	.6652+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4763+04	.1331+01	.1061+03	.2187+03	.4722+02	.4578+02	.1347+04	.2234+04	.2636+03	.0000+00

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T-4 TEST CELL RD0820-13 RUN DATE 05-29-68 TIME 1003 HRS 19 SEC CONFIGURATION 3.2 DATA PT. 22.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE			M8V8	PS8A8	
.9550+00	.3020+04	.2237+04	.4784+04	.6471+04	.1353+01			.1873+03	.1508+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB				FJMMB	FNMM8	SFCMMB
.9829+00	.1010+01	[illegible]	.5510+02	.1443-02				.2802+03	.1992+03	.1290+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC	
.2825+03	.1982+03	.1297+01	.6538+04	.4649+04	.1363+01	.4670+04	.1386+01	.0000+00	.6816+02	
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)	
.6045+00	.5342+00	.1518+01	.9644+00	.6347+00	.9972-02	-.8998-02	.1146-02	-.1862-02	.2260-02	
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV	P8				
-.9521-03	-.9972-02	-.1233-03	.1912-03	.1991+04	.1226+01	.0000+00				

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T-4 TEST CELL RD0820-13 RUN DATE 05-29-68 TIME 1022 HRS 3 SEC CONFIGURATION 3.2 DATA PT. 32.0

(ALT)D	(MO)D	DTO	PLA	N	PCN	FS	WFE	SA	ML
N+6750.	.9245+00	.0000+00	.1233+03	.1374+05	.1007+03	.1854+03	.2595+03	.5119+02	.1861+05
WCW	TT1D	T2	T3	T3.9CALC	T4CALC	T5.0CALC	T5.1CALC	T5.5AVG	
.3053+02	.4486+03	.4670+03	.1213+04	.2788+04	.2714+04	.2064+04	.2010+04	.1969+04	
	POO	PSINA	PSINB	PSI	P2	PS2	P2DIST	P3X	PS3
	.1517+01	.7337+00	.7462+00	.5716+00	.6342+00	.5327+00	.3244+01	.9452+01	.9116+01
PS3CALC	P4CALC	P5.2	P7	PLS					PD
.8971+01	.9058+01	.2037+·01	.1974+01	.3867+00					.3667+00
PSINA/POO	PSINB/POO	P2/PO	P3/P2	PS3/P3	P3/P5.2	P4/P3GE	P5.2/P2	P5.2/PO	P7/PO
.4835+00	.4918+00	.1640+01	.1490+02	.9644+00	.4641+01	.9583+00	.3211+01	.5266+01	.5106+01
T3/T2	T5.1CALC/T2	WAINA	WAINB	WAIN	WA2GE	WC3	WC4	WA3.1	PS8/P7
.2598+01	.4305+01	.1174+01	.1893+01	.3067+01	.3104+01	.2147+00	.1515+00	.2701+01	.1959-00
WA5.1					WG3.9	WG4	WG5.1	WG8	WA4
.3067+01					.2773+01	.2924+01	.3139+01	.3139+01	.2652+01
FE3.9	FE4	FE5.1	HPE	QSW	EFFCOMP	EFFBURN	EFFTURB	EFFROTOR	WAIN/WA2GE
.2669-01	.2528-01	.2351-01	.0000+00	.6579+04	.7087+00	.9631+00	.8221+00	.7654+00	.9881+00
DH4-5/T4	VR3	CIP	WRT/P4CALC	WRT/P5.2	TPL5.2	M1	M3	M5.2	
.7114-01	.6311+02	.3077+02	.1682+02	.6911+02	.3055-01	.4041+00	.2301+00	.5419+00	
	M3EFF	RNI2	RN4	RN8	RNI4GE	DELTA2	THETA2	VO	VOK
	.2768+00	.4940-01	.1146+05	.1212+06	.4272-01	.4315-01	.9003+00	.8680+03	.5143+03
FJS	FR	FNS	SFC	FJCN	CFJCN	A8EFF	A8HOT	TDD	PDD
.2878+03	.8274+02	.2051+03	.1266+01	.2865+03	.1004+01	.1367+03	.1415+03	.3988+03	.3687+00
P7X		FJSD	FNSD	SFCD	NC2	WAINC	FE5.1C	WFEC	FJSC
.1970+01		.2903+03	.2040+03	.1272+01	.1448+05	.6744+02	.2611-01	.6338+04	.6669+04
FNSC	SFCC	PCNC	P3C	P5.2C	P7C	T3C	T5.1C	N/RT4	WSRT/WPRT
.4752+04	.1334+01	.1061+03	.2190+03	.4719+02	.4575+02	.1348+04	.2233+04	.2637+03	.0000+00

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T-4 TEST CELL RD0820-13 RUN DATE 05-29-68   TIME 1022 HRS 3 SEC   CONFIGURATION 3.2 DATA PT. 32.0

EFFBURNGE	T4CGE	T5.1CGE	FNSCGE	WFECGE	SFCCGE		M8V8	PS8A8	
.9567+00	.3018+04	.2235+04	.4772+04	.6465+04	.1355+01		.1689+03	.1518+03	
FJMMB/FJS	T8/T5.5	DPLS	PEA8H	POSTB			FJMMB	FNMMB	SFCMMB
.9838+00	.1016+01	-.[illegible]+00	.5471+02	.4449-03			.2631+03	.2004+03	.1295+01
FJMMBD	FNMMBD	SFCMMBD	FJMMBC	FNMMBC	SFCMMBC	FNMMBCGE	SFCMMBCGE	WHF	WA2GEC
.2855+03	.1993+03	.1302+01	.6561+04	.4643+04	.1365+01	.4663+04	.1386+01	.0000+00	.6825+02
PSLS	PS2W	PS7	CD	P2P	D-DPOO(+)	D-DPOO(-)	D-DPOO-I(+)	D-DPOO-I(-)	D-DPO(+)
.6067+00	.5381+00	.1527+01	.9664+00	.6397+00	.9963-02	-.8066-02	.1344-02	-.9476-03	.9790-03
D-DPO(-)	DPOO AV	DPOO IAV	DPO AV	T8	CFJSV	P8			
-.6370-03	-.9963-02	.2774-03	-.9790-03	.2000+04	.1226+01	.0000+00			

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Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) Arnold Engineering Development Center ARO, Inc., Operating Contractor Arnold Air Force Station, Tennessee	2a. REPORT SECURITY CLASSIFICATION CONFIDENTIAL 2b. GROUP Group 1

3. REPORT TITLE
HIGH ALTITUDE PERFORMANCE TEST OF THE YJ97-GE-3 TURBOJET ENGINE (S/N E447052) (PART II) (U)

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)
May 16 to 29, 1968 - Final Report

5. AUTHOR(S) (First name, middle initial, last name)
W. R. Warwick, R. E. Harper, and T. P. Miller, ARO, Inc.

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
December 1968	182	12

8a. CONTRACT OR GRANT NO. AF40600-69-C-0001	9a. ORIGINATOR'S REPORT NUMBER(S) AEDC-TR-68-244
b. System 468A	
c.	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) N/A
d.	

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11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
Available in DDC.	Air Force Aero-Propulsion Laboratory (APTP), Wright-Patterson AF Base, Ohio 45433

13. ABSTRACT

A turbine endurance test was conducted on a YJ97-GE-3 engine. The test conditions and procedures are reported herein. In addition, the effects on engine performance of shaft power extraction, tailpipe thermal insulation, and exhaust gas swirl are presented along with the exhaust nozzle isentropic gross thrust coefficient. (U)

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14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
supersonic combustion ramjet engine turbojet engines altitude simulation performance durability						

AFSC
Arnold AFS Tenn

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17 June 2014

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Defense Technical Information Center
Attn: Mr. Michael Hamilton (DTIC-R)
8725 John J. Kingman Rd, Suite 0944
Ft Belvoir VA 22060-6218

Dear Mr. Hamilton,

This concerns the following Technical Reports:

AEDC-TR- 68-167, entitled "High Altitude Performance Test of the YJ97-GE-3 Turbojet Engine (SIN E447007) (Part I) October 1968"

AEDC-TR-68-244, entitled, "High Altitude Performance Test of the YJ97-GE-3 Turbojet Engine *(SIN* E447052) (Part II) December 1968"

Previous classification/distribution code: Secret

Subsequent to WPAFB FOIA Control Number 2014-03680-F-ST3, the above record has been cleared for public release.

The review was performed by the following Air Force organization: Air Force Research Laboratory, Turbine Engine Division, Aerospace Systems Directorate.

Therefore, the above record is now fully releasable to the public. Please let my point of contact know when the record is available to the public. Email: Teresa.Corbin.1@us.af.mil If you have any questions, my point of contact is Ms. Teresa Corbin, phone (937) 257-1436.

Sincerely,

Karen Cook

KAREN COOK
Freedom of Information Act Manager
Base Information Management Section
Knowledge Operations

3 Attachments
1. FOIA Request
2. Citation & Cover sheets of Technical Report
3. Copy of AFMC Form 559